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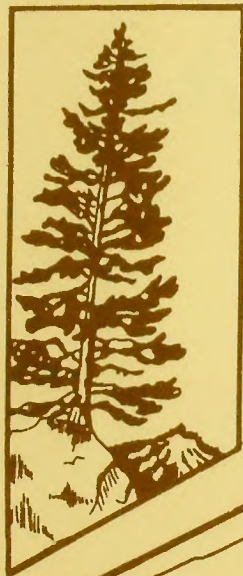
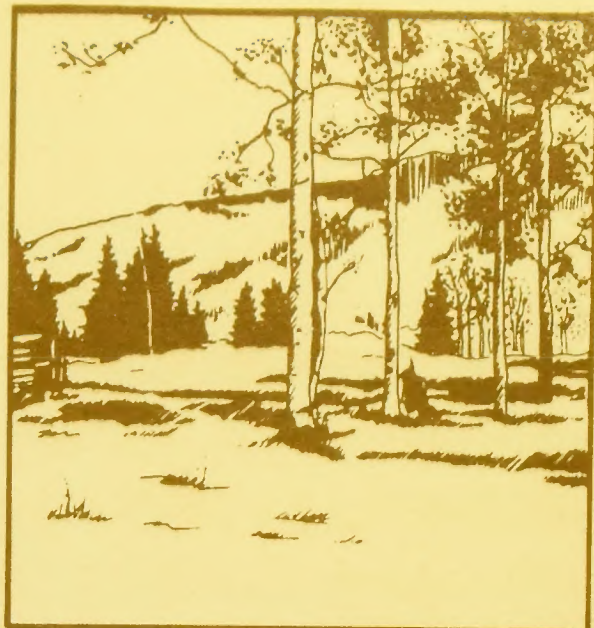
Forest Service

Grand Mesa,
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and Gunnison
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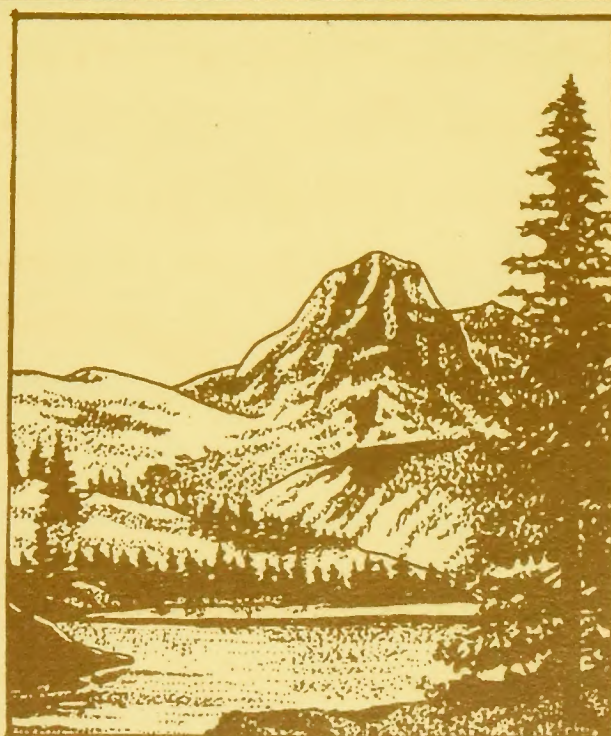
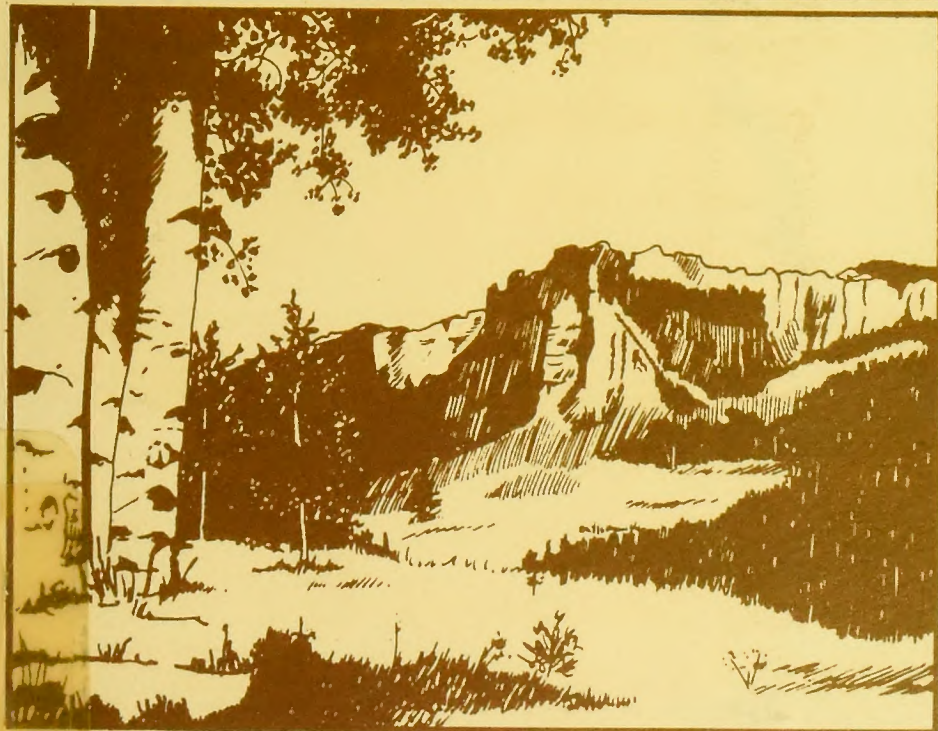


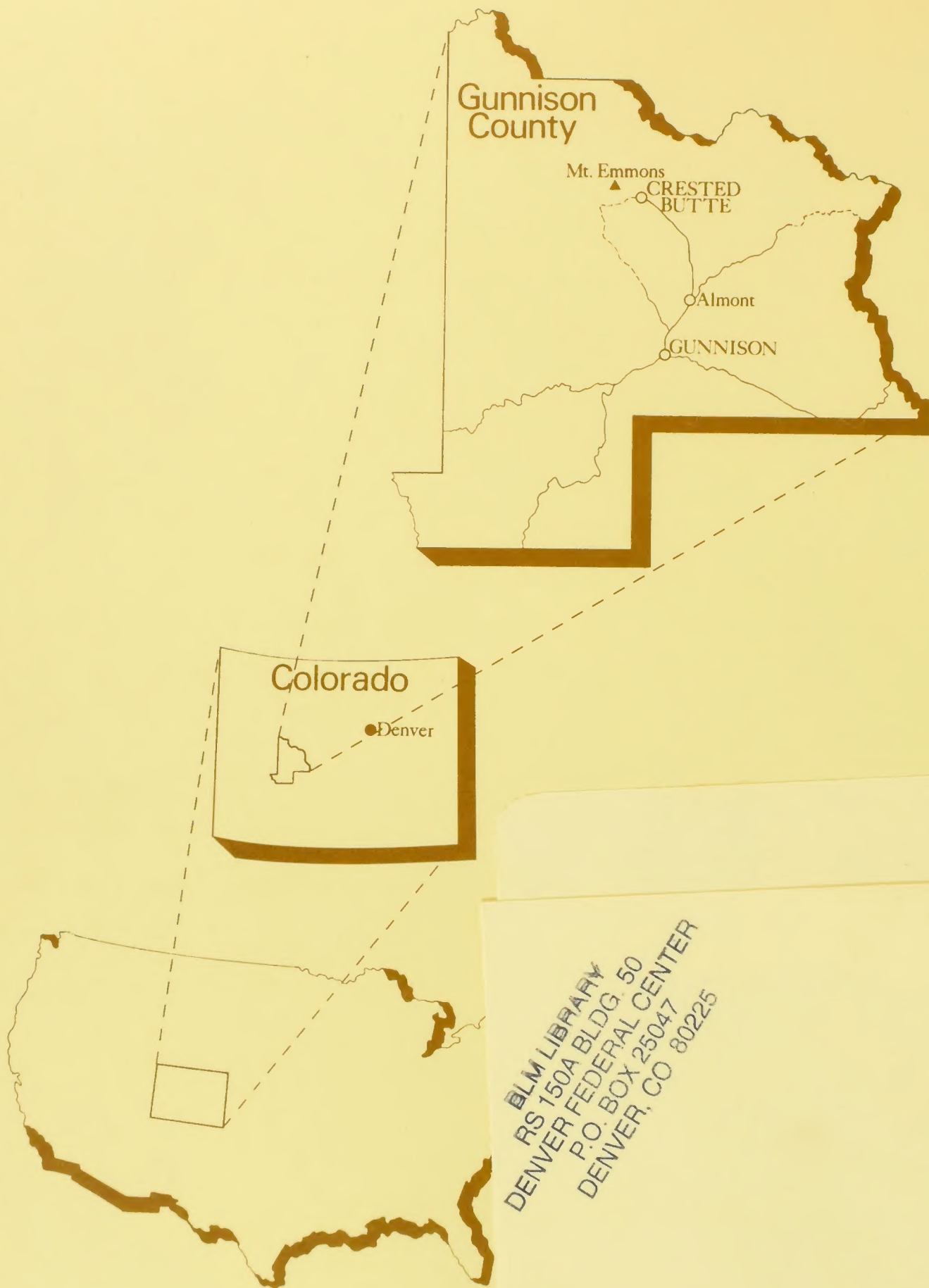
MOUNT EMMONS

Mining Project
ENVIRONMENTAL
IMPACT
STATEMENT



FINAL





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FINAL ENVIRONMENTAL IMPACT STATEMENT
MT. EMMONS PROJECT
GUNNISON COUNTY, COLORADO
02-04-81-03

Lead Agency

USDA - Forest Service

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Cooperating Agencies

Bureau of Land Management
Bureau of Reclamation
Army Corps of Engineers
Environmental Protection
Agency
Rural Electrification
Administration
Bureau of Mines
Department of Energy
Federal Highway
Administration
Fish and Wildlife Service
Department of Housing and
Urban Development
Geological Survey
National Park Service
Soil Conservation Service

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Abstract: This Final Environmental Impact Statement is in response to a proposed Plan of Operations submitted by AMAX, Inc. to the Gunnison National Forest for a molybdenum mining and milling project located in Gunnison County, Colorado. The alternatives are:

PROJECT ALTERNATIVES										
ALTERNATIVE	MINE LOCATION	MILL LOCATION	ORE HAULAGE ROUTE	WORKER ACCESS ROUTE	TONS OF ORE PER DAY	POWER TRANSMISSION: VOLTAGE & CONSTRUCTION METHOD				
						PAONIA TAP TO MINE	MINE TO GUNNISON	GUNNISON TO SOUTH TAP	LAND EXCHANGE	MITIGATION MEASURE(3)
1 No Mine	---	---	---	---	0	---	---	---	NA	---
2 AMAX(1)	Coal Cr.	Alkali	Carbon	Colo. 135	20,000	115 kV OH	115 kV OH	230 kV OH	Proceed(4)	A
3 FS(2)	Coal Cr.	Alkali	Carbon	Colo. 135	20,000	115 kV OH	115 kV OH	230 kV OH	Proceed(5)	B
4	Slate R.	Alkali	East R.	Colo. 135	20,000	115 kV OH	115 kV OH	230 kV OH	NA	B
5	Coal Cr.	Carbon	Splains	Colo. 135	20,000	230 kV OH	115 kV OH	230 kV OH	NA	B
6	Coal Cr.	Carbon	Splains	Colo. 135	10,000	230 kV C	115 kV OH	230 kV OH	NA	B
7	Coal Cr.	Chance Gulch	Ohio Cr.	Colo. 135 & US 50	30,000	115 kV OH	115 kV OH	115 kV OH	NA	B

(1) This is AMAX's proposal.
 (2) This is the Forest Service Preferred Alternative.
 (3) Column entries refer to Appendices:
 A = measures proposed by AMAX, which are described in Appendix A
 B = measures identified by the Forest Service, BMML, and AMAX, which are described in Appendix B
 (4) AMAX's proposal is analyzed without modifications.
 (5) AMAX's proposal is analyzed with modifications described in Appendix F.

NA = Not Applicable: The land exchange proposal applies only to Alternatives 2 and 3.
 OH = Overhead construction
 C = Combination overhead and underground construction

The Draft Environmental Impact Statement was filed with the Environmental Protection Agency and made available to the public on January 20, 1982.

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SUMMARY

SUMMARY

DESCRIPTION

This final Environmental Impact Statement (FEIS) has been prepared by the Forest Service in response to the application by AMAX Inc. to construct and operate a molybdenum mining and milling complex, called the Mt. Emmons Project, partly on National Forest System (NFS) land within Gunnison National Forest in Gunnison County, Colorado. Various federal officials will make decisions regarding the project.

This FEIS documents an environmental analysis of AMAX's proposal and of reasonable alternatives to it. It was prepared in accordance with Section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA) and subsequent regulations promulgated by the Council on Environment-

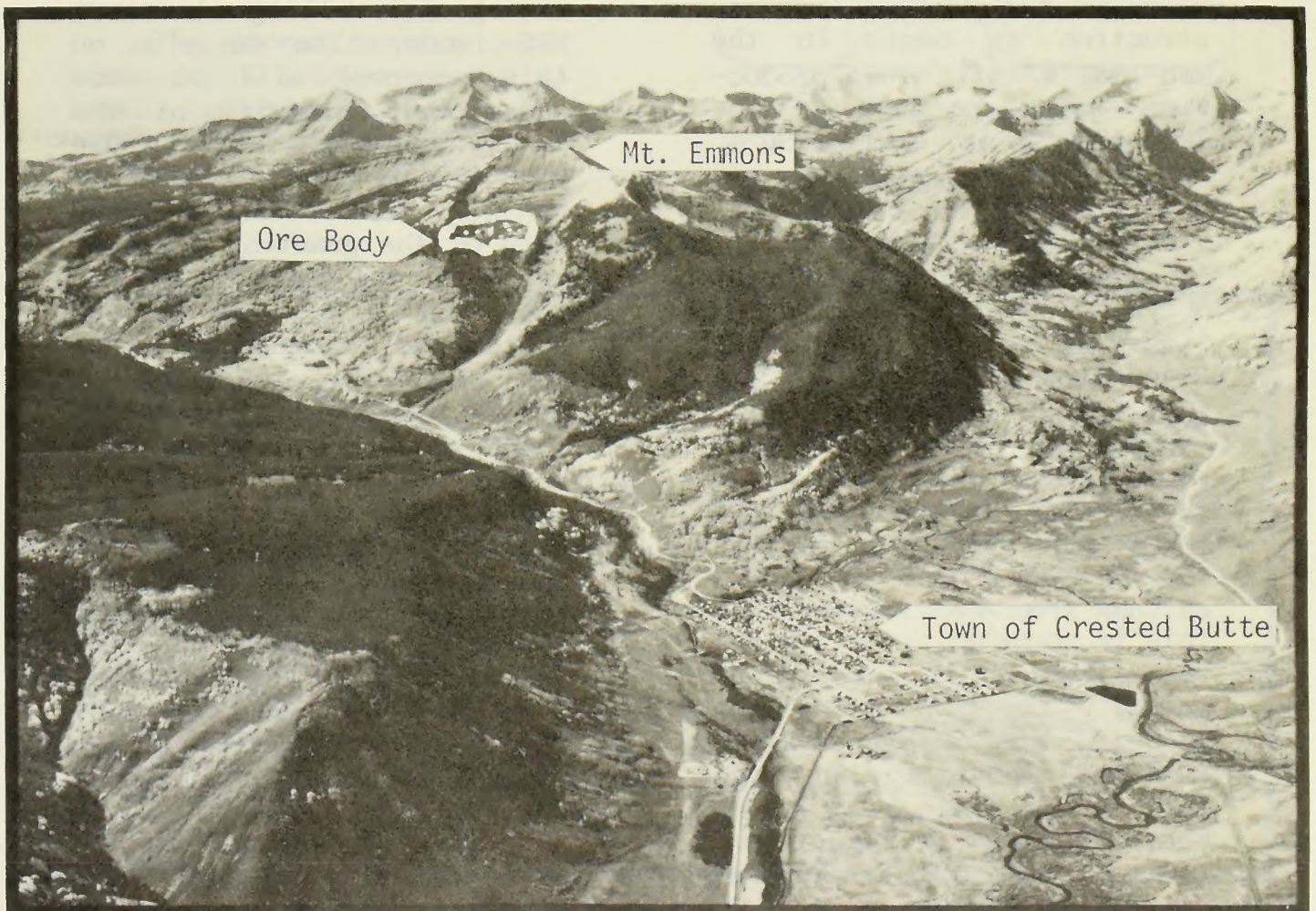
al Quality (40 CFR Parts 1500-1508).

The Draft Environmental Impact Statement (DEIS) was released on January 20, 1982.

An EIS is not a decision document. It is a document disclosing the environmental consequences of implementation of the proposed action and alternatives to the proposed action. It is an important document for Federal, State, and local governments to use in arriving at their individual decisions regarding the proposed action and alternatives to it.

PROJECT SUMMARY

The ore body lies under Mt. Emmons, which rises immediately west of the Town of Crested Butte. Portions of



the ore body underlie patented mining claims, while the remainder underlie NFS lands.

AMAX's proposal involves the following facilities: (a) a mine site on Mt. Emmons in the Coal Creek drainage; (b) a mill site and tailing disposal area in the Alkali Creek area twelve miles southeast of the ore body; (c) a rail ore haulage system; (d) major access roads; and (e) overhead transmission lines connecting the project with two independent sources (one located near Gunnison and one near Paonia). Federal, State and private lands are involved.

As proposed, the project will produce approximately 20,000 tons of ore per day and about 63 million pounds of molybdenum disulfide concentrate per year. The life of the mine will be approximately 30 years. The current schedule generally calls for construction to begin in the mid-1980's, with full production being reached in the late-1980's or early-1990's.

A Plan of Operations was submitted to the Forest Service by AMAX on May 18, 1979, in accordance with the Forest Service's surface use regulations in 36 CFR 252 (1980) recodified at 36 CFR 228 (46 FR 36142, July 14, 1981). Subsequent revisions were submitted in 1980, 1981, and 1982. The current Plan of Operations calls for a 1984 startup date, but other indications from AMAX suggest that this is somewhat uncertain due to softness in molybdenum prices. For portions of the proposed ore haulage system, AMAX has applied for an easement in accordance with the Forest Service's regulations implementing the Federal

Land Policy and Management Act of 1976 (FLPMA, 43 U.S.C. 1716). In addition, AMAX has proposed a land exchange to obtain title to certain lands affected by the Project.

Gunnison County Electric Association (GCEA) has applied for easements for overhead transmission lines to serve the Project. This application was submitted under the Forest Service's regulations implementing FLPMA.

PROJECT DECISIONS

The Forest Service must make several decisions regarding the Project, as described below:

(1) A decision will be made identifying the Plan of Operations that is approved. This will detail the manner in which AMAX is authorized to operate on its unpatented mining and milling claims on NFS lands. The decision on this approval will be made under the authority of the Forest Service's surface use regulations.

(2) Decisions will be made on the granting of easements for the construction and operation of the ore haulage system and transmission lines when on NFS lands that are not AMAX's unpatented claims. These decisions will be made under the authority of FLPMA.

(3) A decision on the proposed land exchange will be made by the Chief of the Forest Service, with oversight review by the House Interior Subcommittee on Public Lands. This decision will be made under the authorities of the General Exchange Act of March 20, 1922, and FLPMA.

The responsible official will use this document, in

part, in making these decisions. A Record of Decision documenting the decision will be prepared in accordance with the Council on Environmental Quality regulations (40 CFR 1505.2). The Record of Decision will include a discussion of the relevant factors and essential considerations which were balanced in making the decision and state how those considerations entered into the decision.

The environmental consequences on lands and activities administered by other Federal, State, and local jurisdictions resulting from the proposed action are disclosed in the final EIS. Through cooperation, other Federal, State, and local jurisdictions have assisted in the disclosure of environmental consequences and the development of alternatives to the proposed action.

The Forest Service decisions will relate only to lands administered by the Forest Service and will be documented in a Record of Decision. Decisions by other

jurisdictions to issue or not issue approvals related to this proposal can be made by them based on the disclosure of impacts available in this document.

ALTERNATIVES CONSIDERED

The Forest Service analyzed seven major alternatives. These are summarized in the table below and described in detail in the following pages.

Two sets of mitigation measures were developed. One was put together by AMAX; the other is based on mitigation measures compiled by the Forest Service. One of these sets is applied to each of the seven alternatives described in the following pages, as specified in the description of each alternative.

ALTERNATIVE 1

This is the No Action alternative. It assumes that the Mt. Emmons Project is not developed.

PROJECT ALTERNATIVES

ALTERNATIVE	MINE LOCATION	MILL LOCATION	ORE HAULAGE ROUTE	WORKER ACCESS ROUTE	TONS OF ORE PER DAY	POWER TRANSMISSION: VOLTAGE & CONSTRUCTION METHOD			LAND EXCHANGE	MITIGATION MEASURE(3)
						PAONIA TAP TO MINE	MINE TO GUNNISON	GUNNISON TO SOUTH TAP		
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3 FS(2)	Coal Cr.	Alkali	Carbon	Colo. 135	20,000	115 kV OH	115 kV OH	230 kV OH	Proceed(5)	B
4	Slate R.	Alkali	East R.	Colo. 135	20,000	115 kV OH	115 kV OH	230 kV OH	NA	B
5	Coal Cr.	Carbon	Splains	Colo. 135	20,000	230 kV OH	115 kV OH	230 kV OH	NA	B
6	Coal Cr.	Carbon	Splains	Colo. 135	10,000	230 kV C	115 kV OH	230 kV OH	NA	B
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(1) This is AMAX's proposal.

(2) This is the Forest Service Preferred Alternative.

(3) Column entries refer to Appendices:

A = measures proposed by AMAX, which are described in Appendix A

B = measures identified by the Forest Service, BMML, and AMAX, which are described in Appendix B

(4) AMAX's proposal is analyzed without modifications.

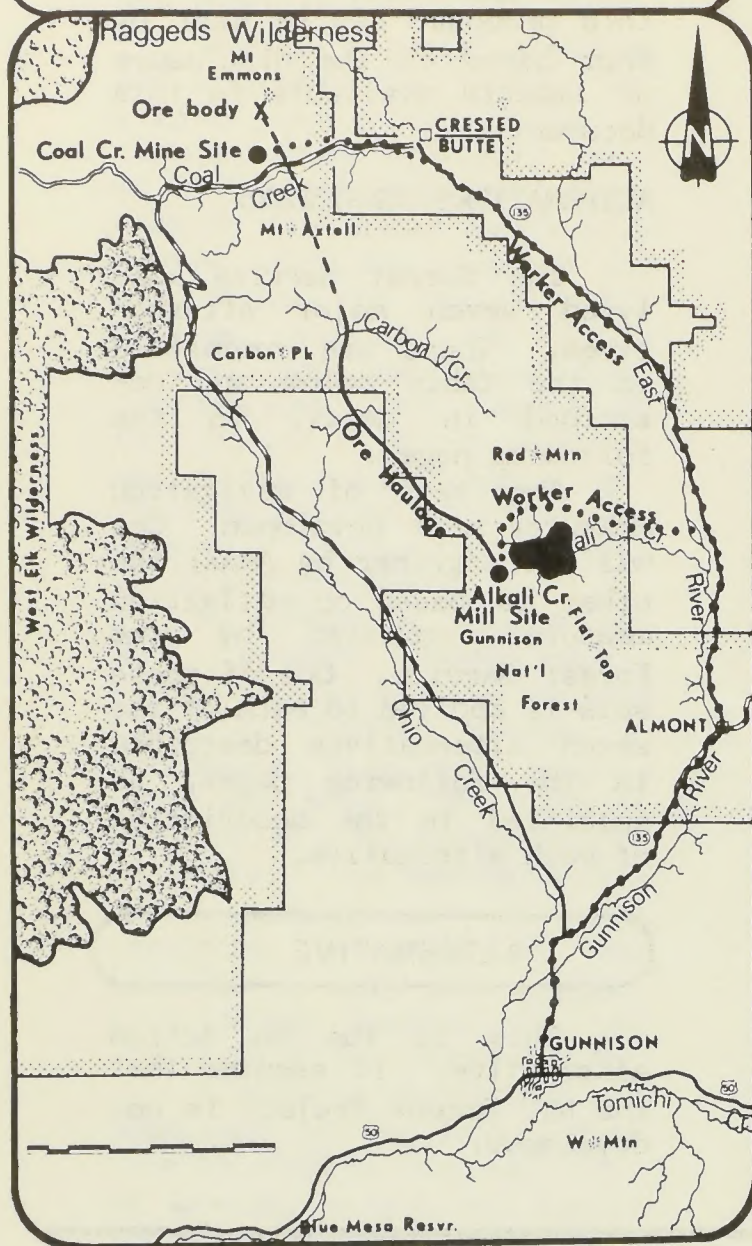
(5) AMAX's proposal is analyzed with modifications described in Appendix F.

NA = Not Applicable: The land exchange proposal applies only to Alternatives 2 and 3.

OH = Overhead construction

C = Combination overhead and underground construction

ALTERNATIVE 2



This Alternative is a combination of AMAX's and GCEA's proposals. As shown above, it involves a Coal Creek mine site and an Alkali Creek mill site. Tailing is impounded behind an impermeable earth-fill dam.

Ore is hauled by a single track electric rail system along the Carbon Creek route. The route exits from Mt. Emmons down-valley from the

mine site, crosses Coal Creek, passes through a 4-mile tunnel under Mt. Axtell, and traverses across the west flank of Red Mountain to the mill. A second 0.7-mile tunnel occurs along this route. Waste rock taken out of the ore haulage tunnel in Mt. Emmons is placed as fill along Coal Creek at the crossing.

Approximately 155 million tons of ore are mined at a production rate of 20,000 tons per day. A panel caving method is used, and the project life is about 30 years.

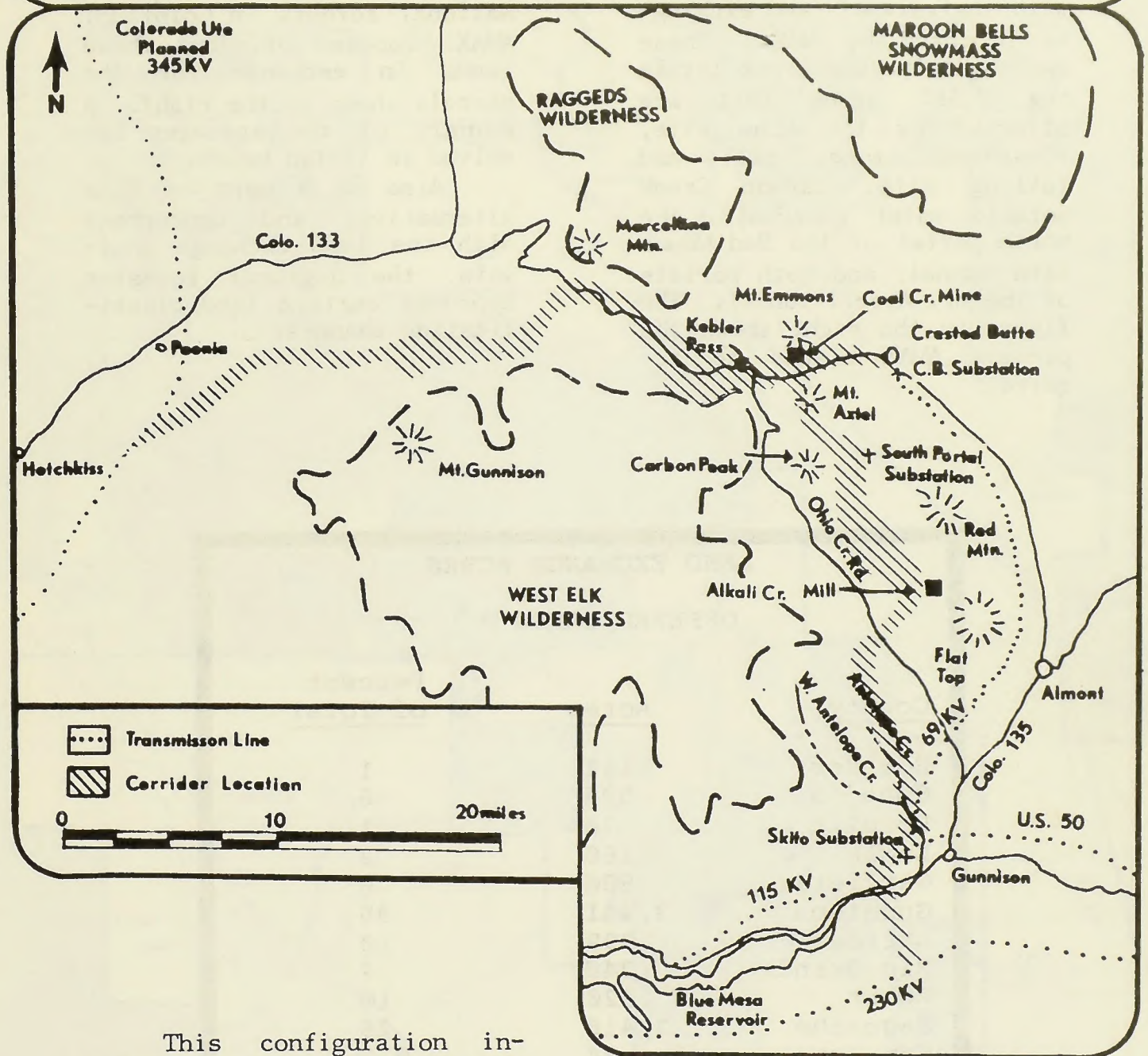
Worker access is via Colorado 135 along the East River valley with a bypass around the south side of the Town of Crested Butte for mine access.

Water for the mill is pumped from the East River to a 2,000 acre-foot storage reservoir located below the tailing dam.

Potable water is stored in a 500 acre-foot reservoir located on Carbon Creek one-half mile east of the Mt. Axtell tunnel's south portal. If additional water is needed, a second reservoir will be placed on Elk Creek immediately west of the mine site.

GCEA's proposed power supply configuration is shown on the opposite page. It is designed to serve Alternative 2, but can also serve Alternatives 3-6. AMAX identified a configuration different from the one shown above, but GCEA chose not to adopt it. AMAX's configuration is included in Alternative 7. It is not considered in this alternative because no applications have been submitted for it.

ALTERNATIVE -2 POWER SUPPLY CONFIGURATION



This configuration involves an overhead system with a normal transmission capacity of 115 kV, except for a short section at the south end which is a double circuit 230 kV line serving the Skito substation on the west side of Gunnison.

The corridor follows Antelope Creek north from the Skito substation, enters the Ohio Creek valley, and climbs to the Alkali Creek mill site. From there it follows the west slopes of Red Mountain to the

east side of Carbon Peak and crosses the west flank of Mt. Axtell to connect with the Coal Creek mine site. A short spur connects the mine site with the Crested Butte substation.

West of the mine site, the corridor crosses through the Kebler Pass area and continues to the vicinity of Paonia.

The mitigation measures proposed by AMAX apply to this Alternative.

As a part of Alternative 2, the Forest Service proceeds with analysis of land exchanges proposed by AMAX. These exchanges include areas totaling 7,587 acres that are affected by the mine site, subsidence zone, mill and tailing site, Carbon Creek potable water reservoir, the north portal of the Red Mountain tunnel, and both portals of the Mt. Axtell tunnel. The figure to the right shows the parcels AMAX wishes to acquire.

AMAX has purchased private inholdings in several National Forests in Colorado. AMAX proposed offering these lands in exchange for the parcels shown to the right. A summary of the acreages involved is listed below.

Also as a part of this alternative, and concurrent with the land exchange analysis, the Regional Forester approves certain land classification changes.

LAND EXCHANGE ACRES

OFFERED LANDS *

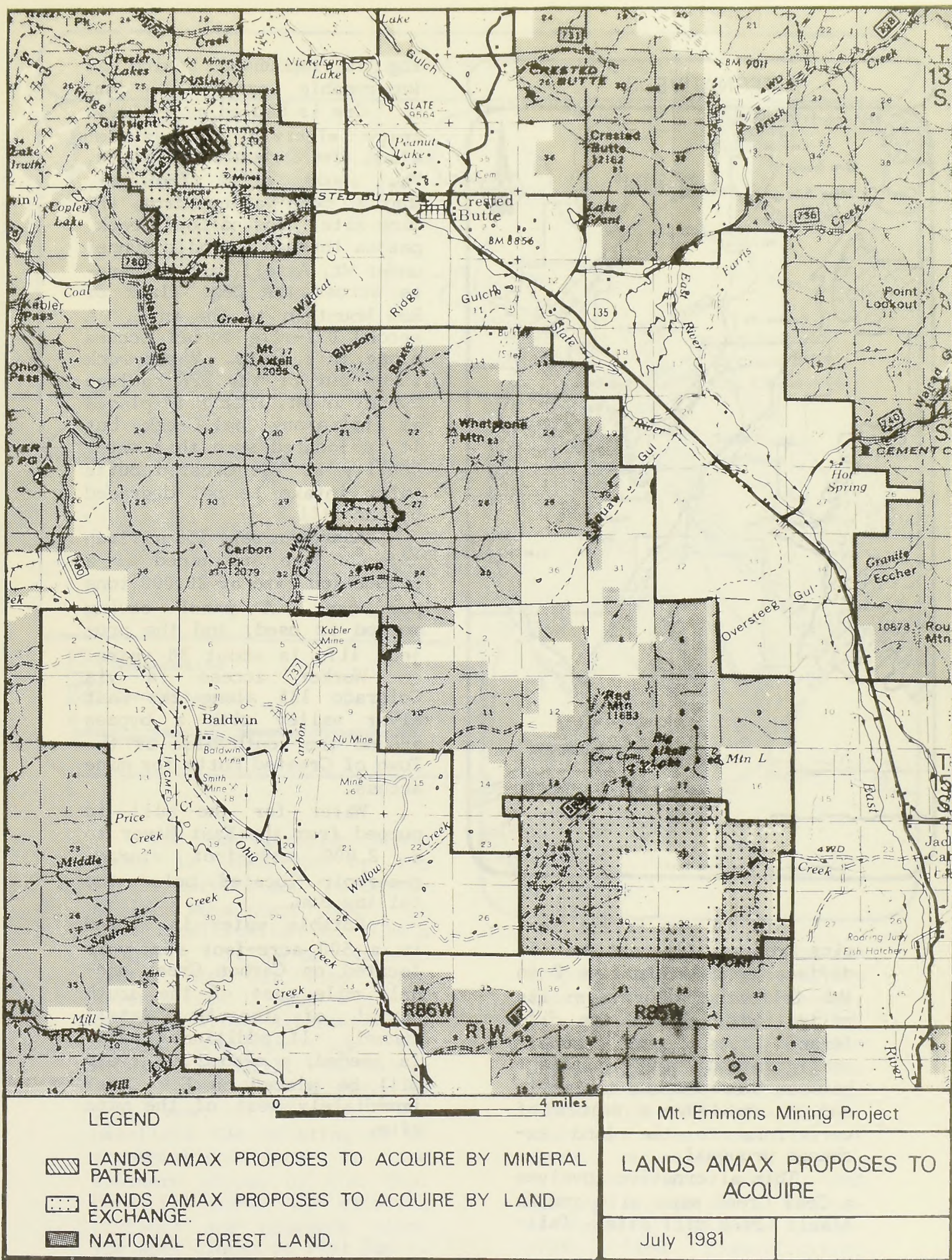
<u>County</u>	<u>Acres</u>	<u>Percent of Total</u>
Boulder	142	1
Conejos	595	6
Douglas	70	1
Eagle	160	2
Garfield	800	8
Gunnison	3,441	35
Larimer	999	10
Rio Grande	240	2
Routt	920	10
Saguache	2,416	25
San Juan	24	0.2
TOTAL	9,807	100.2

SELECTED LANDS **

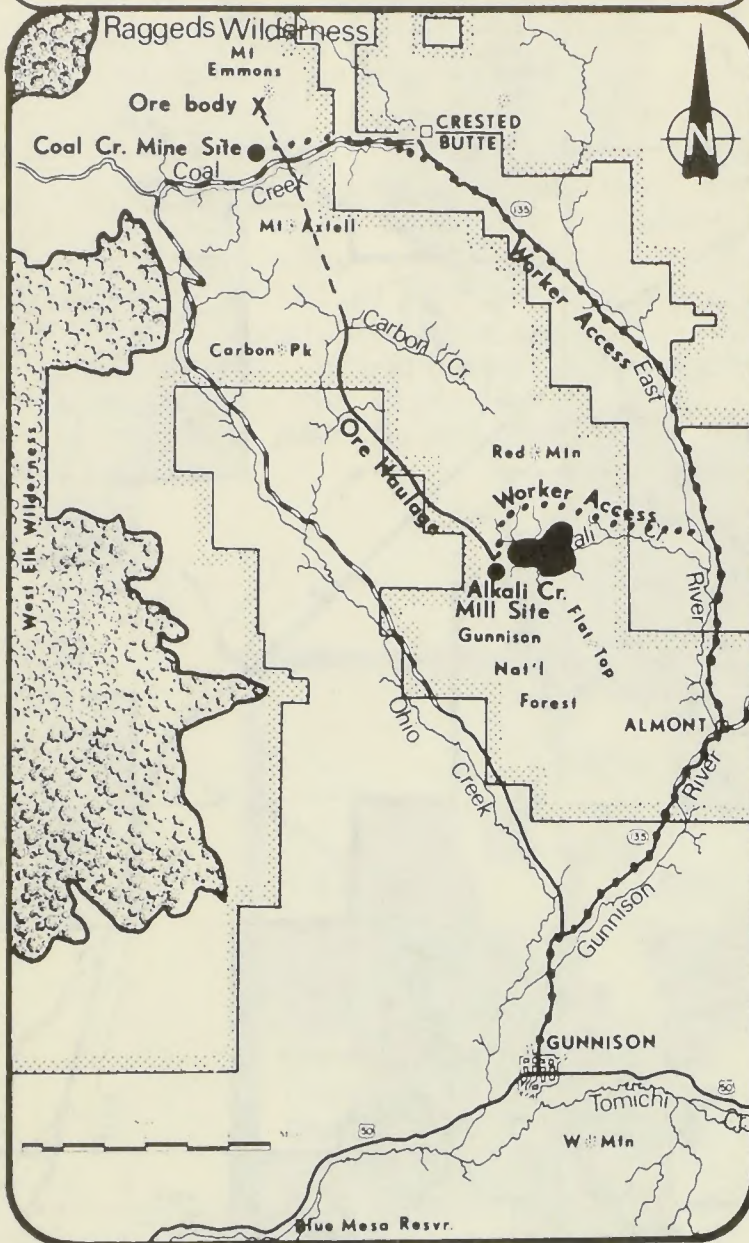
<u>County</u>	<u>Acres</u>	<u>Percent of Total</u>
Gunnison	7,587	100

* Private lands AMAX has offered to the Forest Service.

** NFS lands AMAX wishes to acquire.



ALTERNATIVE 3



This is the Forest Service Preferred Alternative. It differs from Alternative 2 in the following major ways: its mitigation measures are different, its power supply configuration is different between Gunnison and the mill, and it considers a number of variations to the land exchange proposal.

This alternative involves a Coal Creek mine site and an Alkali Creek mill site. Tail-

ing is impounded behind an impermeable earth-fill dam.

Ore is hauled by a single track electric rail system along the Carbon Creek route. The route exits from Mt. Emmons down-valley from the mine site, crosses Coal Creek, passes through a 4-mile tunnel under Mt. Axtell, and traverses across the west flank of Red Mountain to the mill. A second 0.7-mile tunnel occurs along this route. Waste rock taken out of the ore haulage tunnel in Mt. Emmons is placed as fill along Coal Creek, but it is located such that water quality at the Crested Butte water intake is not degraded by the fill.

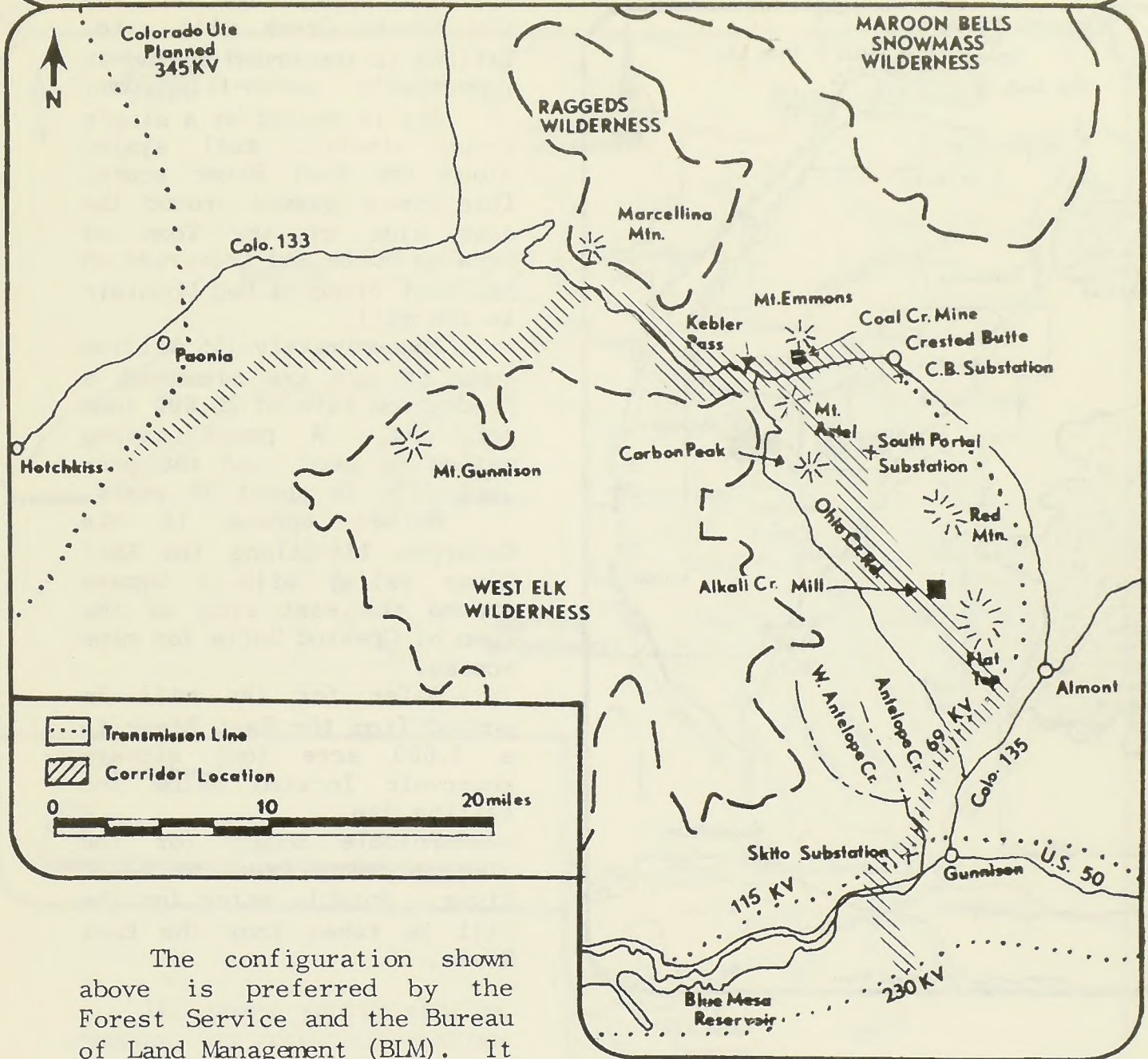
Approximately 155 million tons of ore are mined at a production rate of 20,000 tons per day. A panel caving method is used, and the project life is about 30 years.

Worker access is via Colorado 135 along the East River valley with a bypass around the south side of the Town of Crested Butte for mine access.

Water for the mill is pumped from the East River to a 2,000 acre-foot storage reservoir located below the tailing dam.

Potable water is stored in a 500 acre-foot reservoir located on Carbon Creek one-half mile east of the south portal of the Mt. Axtell tunnel. If additional water is needed, a second reservoir will be placed on Elk Creek immediately west of the mine site.

ALTERNATIVE- 3 POWER SUPPLY CONFIGURATION



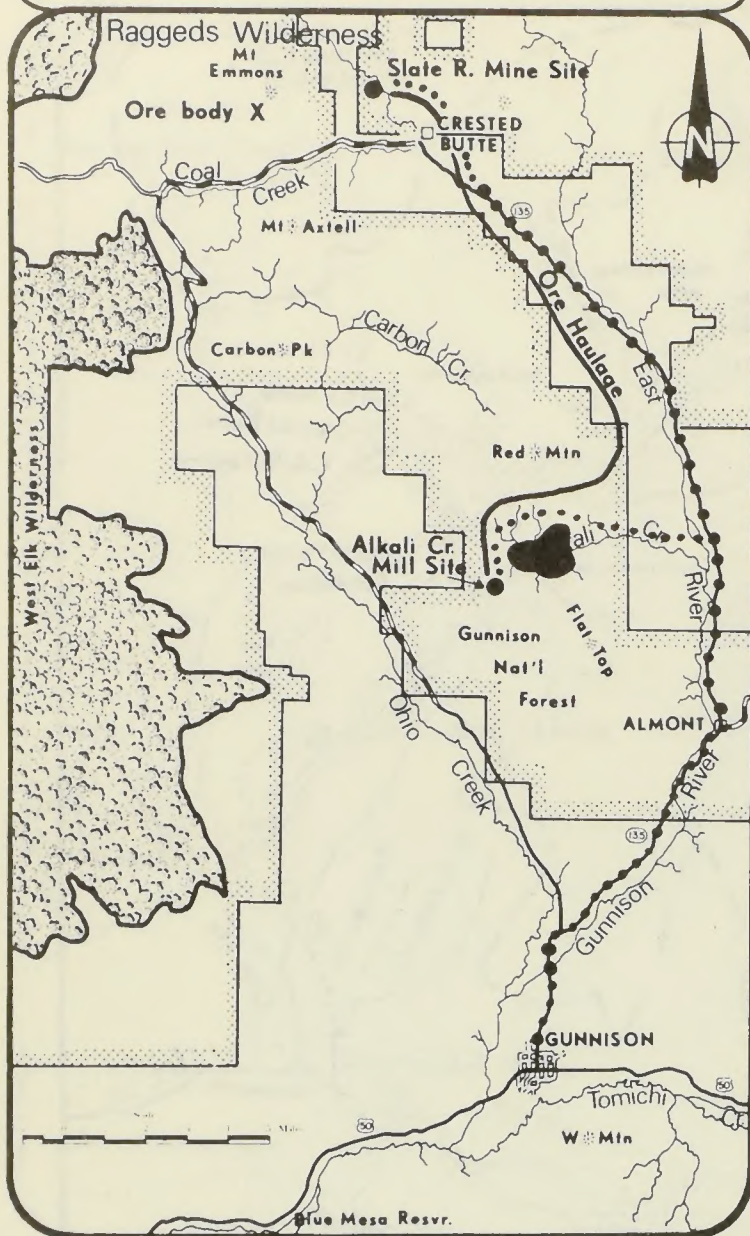
The configuration shown above is preferred by the Forest Service and the Bureau of Land Management (BLM). It is a modification of GCEA's proposal. It is an overhead system that can also serve Alternatives 2 and 4-6. It differs from Alternative 2 between Gunnison and the Alkali Creek mill. The corridor crosses U.S. Highway 50 just west of Gunnison and parallels the existing 69 kV transmission line to the southern slopes of Flat Top. Here it leaves the existing corridor and proceeds along the west slopes of Flat Top to the mill.

The mitigation measures proposed by the Forest Service apply to this alternative.

As part of this alternative, the Forest Service proceeds with analysis of the land exchanges proposed by AMAX (Alternative 2), but it also includes analysis of several variations.

Concurrent with land exchange analysis, the Regional Forester approves appropriate land classification changes.

ALTERNATIVE 4



This alternative involves the Slate River mine site and the Alkali Creek mill site. Tailing is impounded behind an impermeable earth-fill dam.

Ore is hauled by a single track electric rail system along the East River route. This route passes around the east side of the Town of Crested Butte and traverses up the east flank of Red Mountain to the mill.

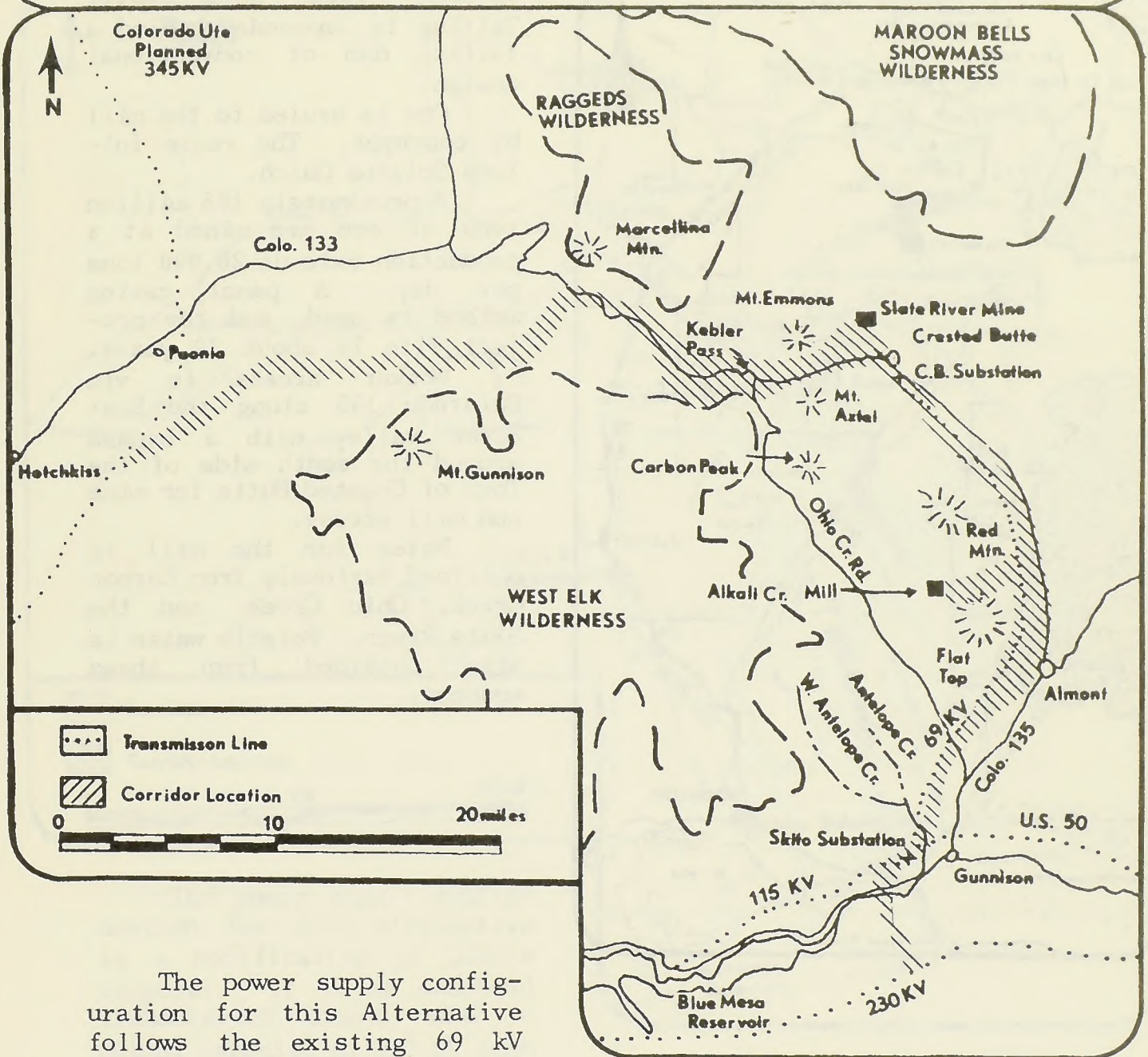
Approximately 155 million tons of ore are mined at a production rate of 20,000 tons per day. A panel caving method is used, and the project life is about 30 years.

Worker access is via Colorado 135 along the East River valley with a bypass around the east side of the Town of Crested Butte for mine access.

Water for the mill is pumped from the East River to a 2,000 acre foot storage reservoir located below the tailing dam.

Potable water for the mine is taken from the Slate River. Potable water for the mill is taken from the East River.

ALTERNATIVE-4 POWER SUPPLY CONFIGURATION



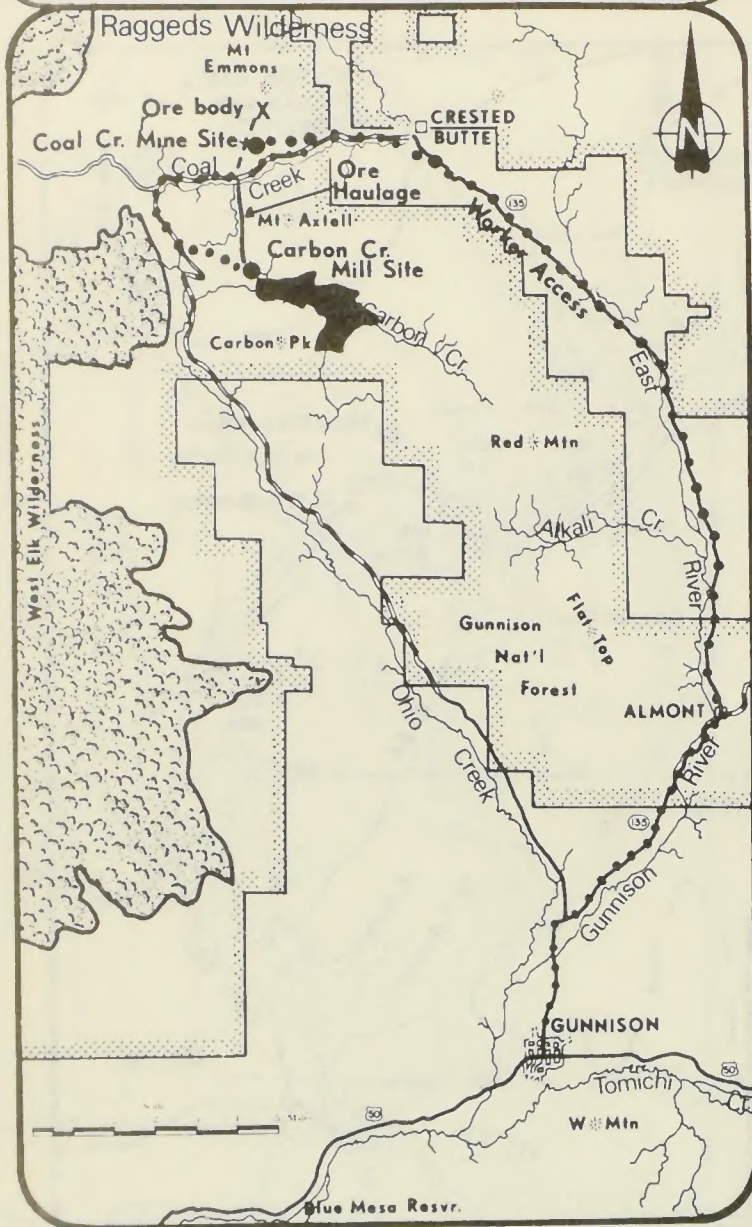
The power supply configuration for this Alternative follows the existing 69 kV transmission line between Gunnison and the Crested Butte area. It is an overhead system serving only Alternative 4. The corridor crosses U.S. Highway 50 just west of Gunnison and then follows the existing line into the East River valley and on to the Crested Butte substation. A short double circuit spur connects with the Alkali Creek mill site, and a single circuit goes north to the Slate River mine site. The main

corridor goes west of Kebler Pass to the Paonia area.

The mitigation measures proposed by the Forest Service apply to this alternative.

No land exchange proposal specific to this Alternative has been identified, but it is possible that one would be submitted if the Alternative were to be implemented.

ALTERNATIVE 5



This alternative involves a Coal Creek mine site and a Carbon Creek mill site. Tailing is impounded behind a tailing dam of conventional design.

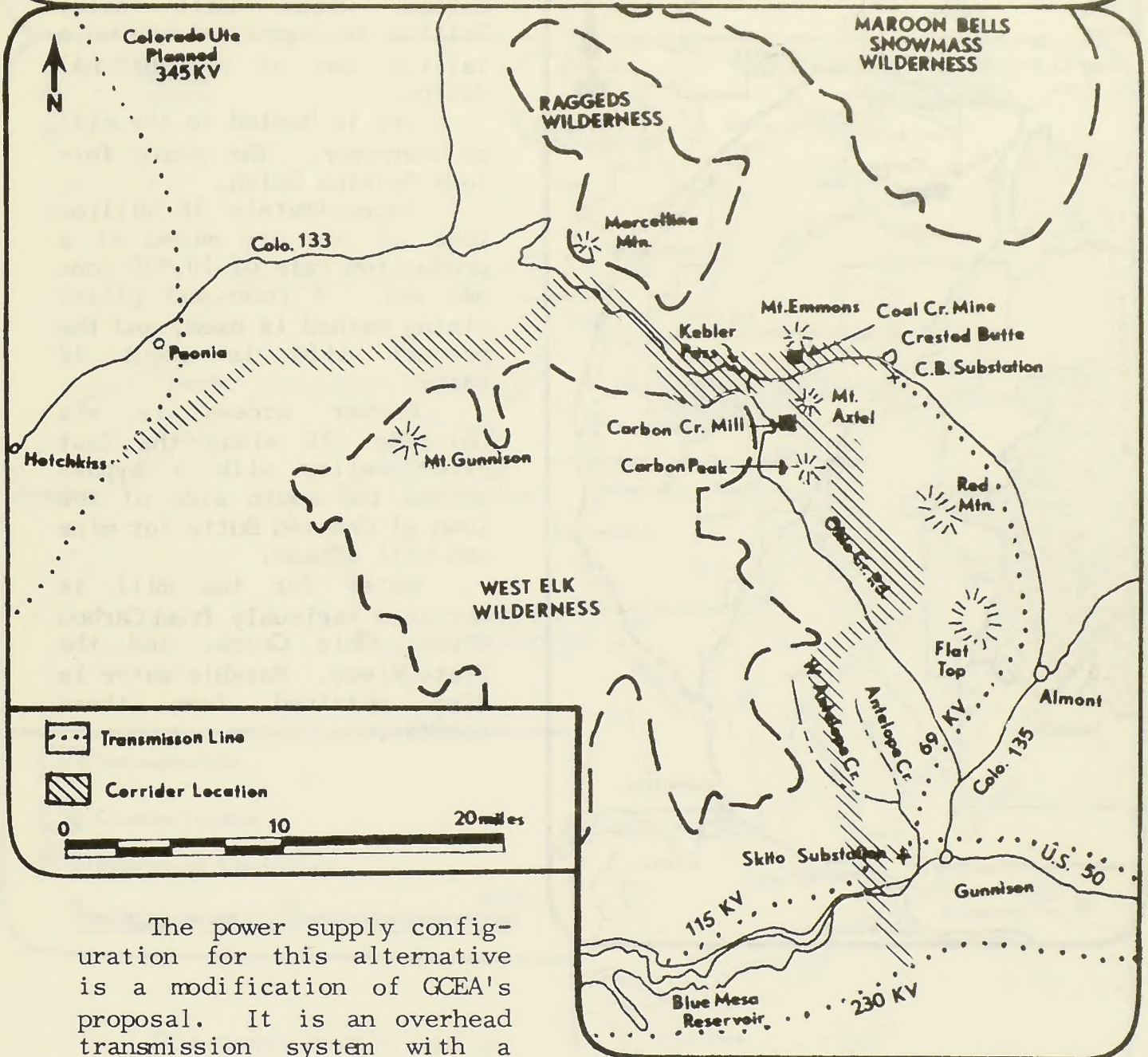
Ore is hauled to the mill by conveyor. The route follows Splains Gulch.

Approximately 155 million tons of ore are mined at a production rate of 20,000 tons per day. A panel caving method is used, and the project life is about 30 years.

Worker access is via Colorado 135 along the East River valley with a bypass around the south side of the Town of Crested Butte for mine and mill access.

Water for the mill is obtained variously from Carbon Creek, Ohio Creek, and the Slate River. Potable water is also obtained from these sources.

ALTERNATIVE-5 POWER SUPPLY CONFIGURATION



The power supply configuration for this alternative is a modification of GCEA's proposal. It is an overhead transmission system with a normal capacity of 230 kV from the Paonia area to the mine site. The system south to Gunnison has a capacity of 115 kV, with the exception of a short double circuit 230 kV line at the extreme southern end.

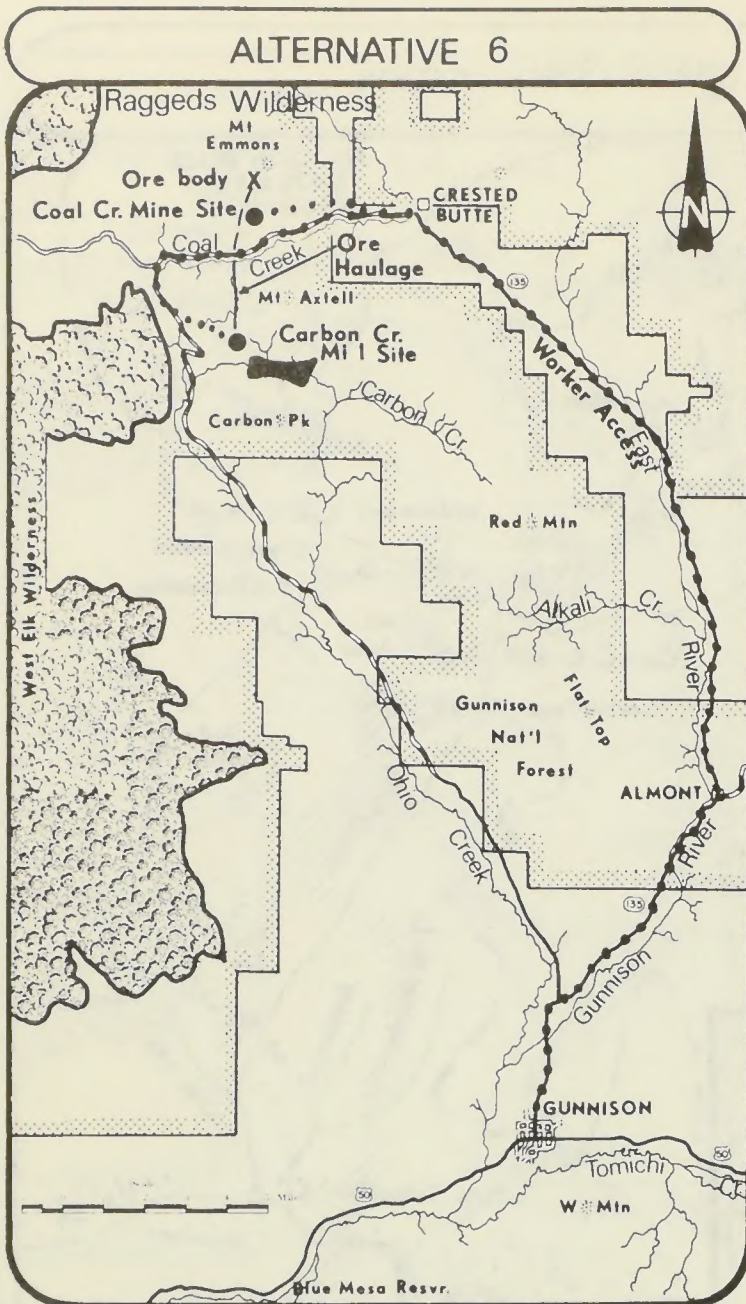
The corridor begins southwest of Gunnison and crosses U.S. Highway 50 just west of the city. It turns east a short distance to connect with the Skito substation and then doubles back to turn northward between Ante-

lope Creek and West Antelope Creek. It then proceeds in a northerly direction to the Carbon Creek mill site.

The mitigation measures proposed by the Forest Service apply to this alternative.

No land exchange proposal specific to this Alternative has been identified, but it is possible that one would be submitted if the Alternative were to be implemented.

ALTERNATIVE 6



This is the "Small Mine" Alternative. It involves a Coal Creek mine site and a Carbon Creek mill site. Tailing is impounded behind a tailing dam of conventional design.

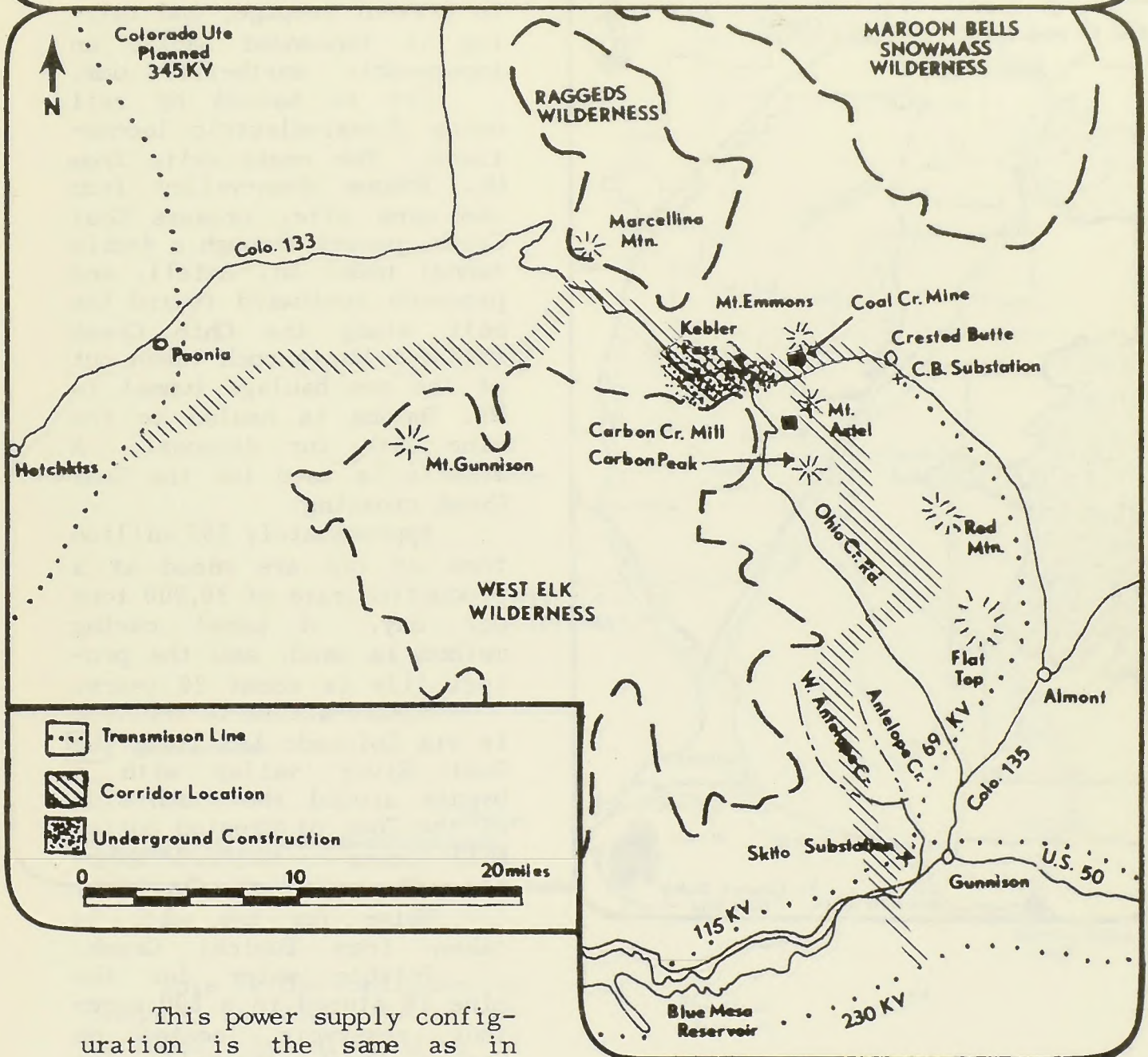
Ore is hauled to the mill by conveyor. The route follows Splains Gulch.

Approximately 38 million tons of ore are mined at a production rate of 10,000 tons per day. A room and pillar mining method is used, and the project life is about 12 years.

Worker access is via Colorado 135 along the East River valley with a bypass around the south side of the Town of Crested Butte for mine and mill access.

Water for the mill is obtained variously from Carbon Creek, Ohio Creek, and the Slate River. Potable water is also obtained from these sources.

ALTERNATIVE-6 POWER SUPPLY CONFIGURATION



This power supply configuration is the same as in Alternative 5 except that a part of the system is placed underground. Beginning approximately one-half mile east of Kebler Pass and extending to approximately three miles east of Marcellina Mountain, a high pressure, oil-filled electrical transmission pipeline is installed underground.

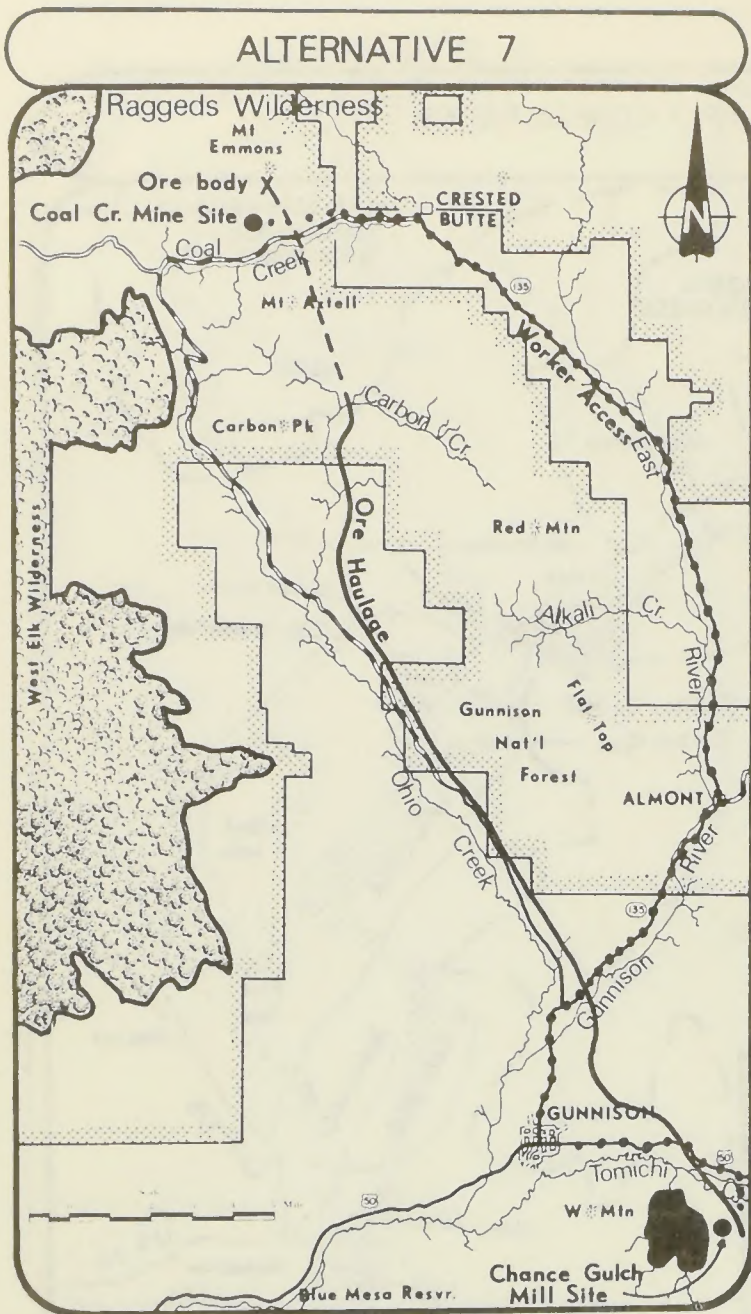
The system has a normal capacity of 230 kV from the Paonia area to the mine site. The system south to Gunnison has a capacity of 115 kV, with

the exception of a short double circuit 230 kV line at the extreme southern end.

The mitigation measures proposed by the Forest Service apply to this alternative.

No land exchange proposal specific to this Alternative has been identified, but it is possible that one would be submitted if the Alternative were to be implemented.

ALTERNATIVE 7



This alternative involves a Coal Creek mine site and a Chance Gulch mill site. The tailing disposal area is lined to prevent seepage, and tailing is impounded behind an impermeable earth-fill dam.

Ore is hauled by rail using diesel-electric locomotives. The route exits from Mt. Emmons down-valley from the mine site, crosses Coal Creek, passes through a 4-mile tunnel under Mt. Axtell, and proceeds southward toward the mill along the Ohio Creek valley. Waste rock taken out of the ore haulage tunnel in Mt. Emmons is hauled to the mine site for disposal. A trestle is used for the Coal Creek crossing.

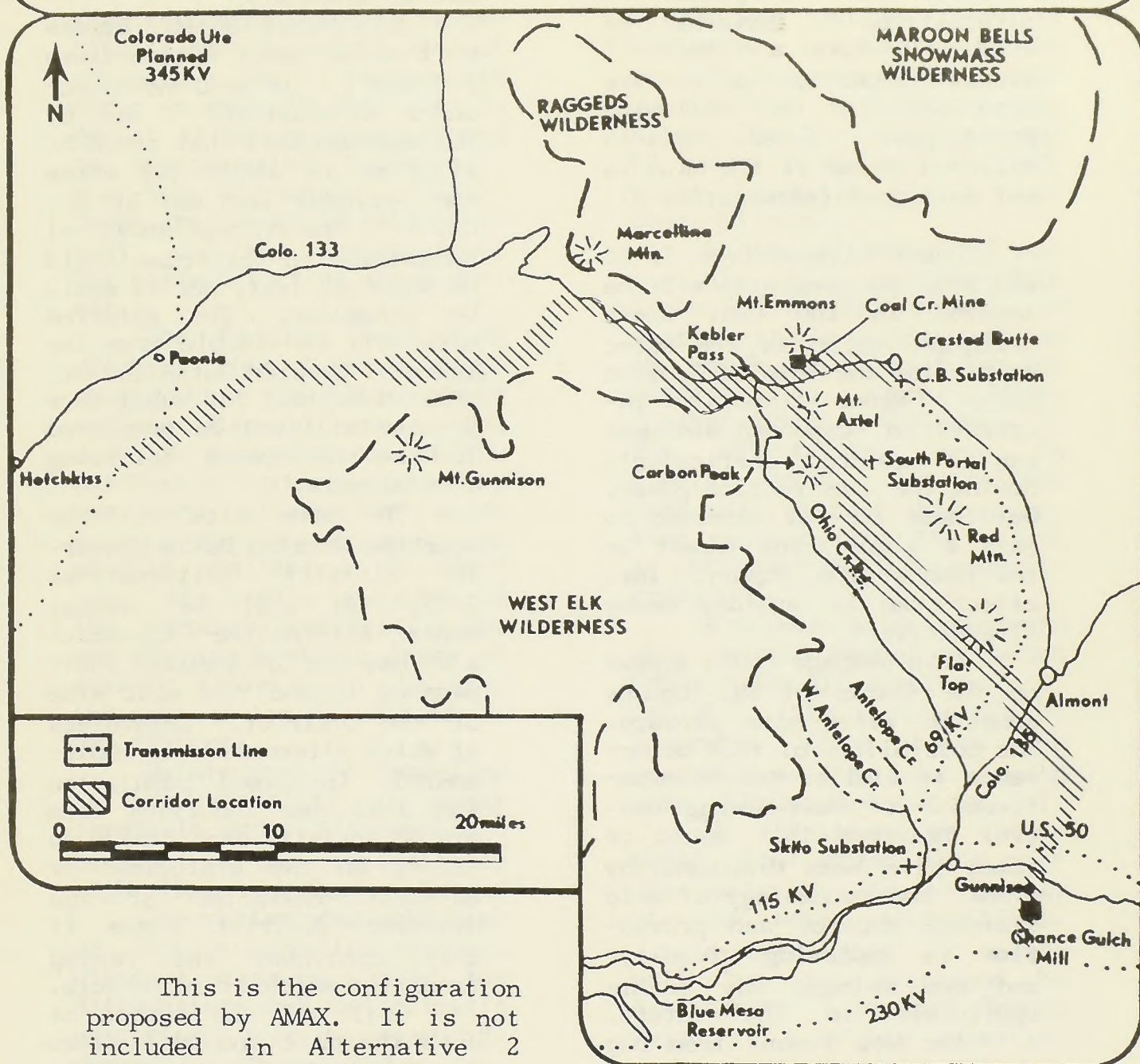
Approximately 155 million tons of ore are mined at a production rate of 30,000 tons per day. A panel caving method is used, and the project life is about 20 years.

Worker access to the mine is via Colorado 135 along the East River valley with a bypass around the south side of the Town of Crested Butte. Mill access is via U.S. Highway 50 east of Gunnison.

Water for the mill is taken from Tomichi Creek.

Potable water for the mine is stored in a 500 acre-foot reservoir located on Carbon Creek one-half mile east of the south portal of the Mt. Axtell tunnel. If additional water is needed, a second reservoir will be placed on Elk Creek immediately west of the mine site. Potable water for the mill is taken out of Tomichi Creek.

ALTERNATIVE-7 POWER SUPPLY CONFIGURATION



This is the configuration proposed by AMAX. It is not included in Alternative 2 because no applications have been submitted for it. It is an overhead 115 kV system that begins southeast of Gunnison and passes through the Chance Gulch area. It crosses U.S. Highway 50 east of Gunnison and continues northward, crossing Colorado 135 south of Almont and then passing around the west side of Flat Top to reach the top of Alkali Basin. From there it follows the same route as described in Alternative 2.

The mitigation measures proposed by the Forest Service apply to this alternative.

No land exchange proposal specific to this Alternative has been identified, but it is possible that one would be submitted if the Alternative were to be implemented.

IMPACTS

All of the production alternatives (Alternatives 2-7) will have a number of direct impacts, which are discussed in the following paragraphs. These impacts will not occur if the mine is not developed (Alternative 1).

Under Alternatives 2, 3, and 5-7, the mine site will be located in the Coal Creek drainage, which is the water supply for the Town of Crested Butte. Minor temporary increases in suspended sediment can be expected, particularly during the construction phase, but these are not expected to have a significant impact on the Town's water supply. This effect can be avoided under Alternative 4.

Acid seepage could appear on the flanks of Mt. Emmons sometime after mine closure. The possibility of this occurrence is similar for Alternatives 2-7. Post-mining control measures that could be taken have been discussed by AMAX. The technology of acid drainage control and prevention is improving steadily, and new methods may become applicable in the future.

The Mt. Emmons Iron Bog supports the round-leaf sundew plant. It is not on the rare and endangered species list, but its only known occurrence in Colorado is in this Iron Bog. The bog is fed by acidic metals-rich spring water that has passed through the bedrock of Mt. Emmons. As mining the ore body will locally disrupt groundwater flow patterns in the mountain, the Bog could lose its water source. Under Alternatives 2-7, AMAX will take steps to maintain the

Iron Bog's water supply. Under Alternative 1 this would not be necessary.

Subsidence on Mt. Emmons will occur under Alternatives 2-5 and 7. It will not occur under Alternatives 1 and 6. The maximum area that could be affected is about 900 acres and includes the top of Mt. Emmons. The average amount of subsidence in this case could be about 50 feet, but it would be irregular. The affected area will be visible from the Towns of Crested Butte and Mt. Crested Butte. The subsidence process will not be completed for several years following mine closure.

The mine site will be near the Crested Butte Historic District (Alternatives 2-7). It will be closest under Alternative 4, which also has the ore haulage route passing around the east side of the District. Regardless of which alternative is implemented, increased population and area use resulting from mining activity should have no effect on the historical or cultural character of the Historic District since it only continues the mining tradition which it represents.

Coal will be burned at both the mine and mill sites for heating purposes. The Colorado Department of Health has already issued permits for Alternative 2. Air quality modelling for the other alternatives indicates that National Ambient Air Quality Standards will be met. Air quality in the West Elk Wilderness will not be significantly impacted by any of the alternatives.

The risks of seepage from the tailing deposit are greatest under Alternatives 5 and 6

due to the geologic complexity in the Carbon Creek area. Lining the tailing disposal area at Chance Gulch (Alternative 7) should control seepage adequately, but if seepage did occur it would be difficult to detect at an early stage and may be impossible to correct. The risks of seepage at Alkali Creek are lowest (Alternatives 2-4), and the opportunities for early detection are greatest.

The Roaring Judy Fish Hatchery lies 3 miles down-valley from the Alkali Creek tailing disposal area. The risk of contamination of the Hatchery's water supply is low, and alternative water sources for the Hatchery are readily available. In addition, the stable character of the proposed earth-fill dam and the low historic level of seismic activity in the area indicate a low likelihood of dam failure.

Maintenance of long-term tailing stability is least favorable under Alternative 5 because of the comparatively high flows of Carbon Creek.

The reclamation potential of the alternative tailing disposal areas is similar for Alternatives 2-7, but climatic variations lead to some differences. Chance Gulch (Alternative 7) is comparatively dry and has the least favorable climate for tailing area revegetation. Carbon Creek (Alternatives 5 and 6) and Alkali Creek (Alternatives 2-4) have more favorable moisture conditions.

Wetlands will be impacted locally under all alternatives. The most significant impacts will occur under Alternatives 2-6 because of the wetlands that will be

buried under tailing. At Alkali Creek (Alternatives 2-4), about 43 acres of natural wetland and 99 acres of irrigated haymeadow having wetland characteristics will be covered. At Carbon Creek, Alternative 5 will cover about 84 acres of natural wetland, while Alternative 6 will cover about 53 acres.

A herd of about 160 elk use the area between Ohio Creek and the East River. It winters at low elevations on the south end of Flat Top and migrates to summer range further north. Placement of the mill-tailing area in Alkali Creek (Alternatives 2-4) will disrupt this migration pattern, but the effect is not expected to be significant.

A potable water reservoir will be constructed on Carbon Creek under Alternatives 2, 3, and 5-7. The maintenance of favorable flows below the reservoir will be best assured under Alternatives 3 and 5-7.

No threatened or endangered plant or wildlife species will be affected by any of the seven alternatives.

Archaeological values will be most disturbed by Alternative 7 because Chance Gulch is a highly sensitive archaeological area. Alternatives 2-4 will disturb archaeological values the least.

No prime agricultural land will be affected by any of the alternatives.

National Forest timber production will not be significantly affected by any of the alternatives.

Installation of a looped power supply system will create minor visual impacts. Burial of parts of the system through visually sensitive areas (Alternative 6) may

moderate some of the effects but may introduce other adverse effects. Alternatives 3 and 4 take the most advantage of existing power line corridors to minimize new corridor construction.

The land exchange proposed by AMAX (Alternative 2) would give the Company maximum control over Project activities. Under Alternative 3, variations on this proposal offer a chance to resolve a number of resource conflicts in the public sector and, at the same time, maintain the NFS resource base.

In addition to the direct effects summarized above, a number of indirect impacts will also occur. These are discussed in the following paragraphs.

Under Alternative 1, the Gunnison area is expected to experience a 2-4 percent annual growth in population.

Rapid population growth is anticipated under Alternatives 2-7, but even under Alternatives 1 growth problems will exist. Alternatives 2-7 are similar in that the types of growth pressures will be the same, differing mainly in degree. They will all require significant increases in housing, school capacity, and wastewater treatment capacity, to name only a few. The growth center will be the city of Gunnison. Among Alternatives 2-7, Alternative 6 will require the least local adjustment to growth, but it also involves the shortest Project life and will bring mine closure within 12 years of the rapid growth period.

Housing construction may impact natural wetlands, with

the highest chance of impact coming under Alternatives 2-5 and 7.

The impacts of local population growth on big game due to general harassment and winter range lost to urban development are likely to be greater than from any direct impacts. Thus, Alternatives 2-5 and 7 will have the most impact.

Population growth will lead to an increase in secondary air emissions, which will be greatest under Alternatives 2-5 and 7, and least under Alternative 1.

Outdoor recreation activities will increase under all alternatives, with Alternatives 2-5 and 7 generating the most increase and Alternative 1 the least. However, the differences between alternatives are small compared to the overall level of recreation use generated by visitors from other areas.

Under all alternatives, demand for electricity is expected to rise due to population growth. Some improvements are likely to be added before 1995 to make more power available.

If the mine is not developed (Alternative 1), the 682,000 tons of molybdenum disulfide (over 817 million pounds of molybdenum metal) in the Mt. Emmons ore body will not contribute to the world supply of molybdenum. Economic benefits (local, statewide, and national) of mining and processing the mineral deposit will not occur. These benefits include an increase in the local tax base, increased employment, payment of Colorado severance taxes totalling \$23.25 million, and exports to foreign countries.

Under the Small Mine alternative (Alternative 6), 117 million tons of the ore body identified by AMAX would be left in place and would probably become unminable. This tonnage would be extracted under the other production alternatives (Alternatives 2-5, and 7).

PREFACE

PREFACE

The draft Environmental Impact Statement (DEIS) for the Mt. Emmons Mining Project was filed with the Environmental Protection Agency and the Notice of Availability was published in the January 29, 1982 Federal Register. The official public comment period ended March 20, 1982. Two public meetings were held (one in Gunnison and one in Denver) and a total of 123 comments were received during the comment period.

Following the public review period for the DEIS, all public comments were carefully reviewed to determine the appropriate means of response. This review indicated need for only minor changes in the DEIS, and it was concluded that the DEIS would not be completely rewritten. Instead, a Final Environmental Impact Statement (FEIS) was prepared which updates, clarifies, and improves the information in the DEIS. This approach is consistent with Section 1500.4 of the Council on Environmental Quality's National Environmental Policy Act regulations, which encourages the reduction of excessive paperwork, and with Section 1503.4, which permits that only comments, the responses, and the changes to the DEIS need be circulated.

The FEIS does not reproduce the DEIS in its entirety. Because it relies heavily on the DEIS for most discussions, reviewers may need to have both documents available. Reviewers who do not have a DEIS may contact the Mt. Emmons Project Leader listed on the Cover Sheet of this document to obtain a copy.

The FEIS follows the same chapter organization as the DEIS. Sections of the DEIS that are not modified by the FEIS are not included in the FEIS.

ERRATA

ERRATA

DEIS p. xix, second column, 1st sentence: "At Alkali Creek (Alternatives 2-4), about 43 acres of natural wetland and 99 acres of irrigated haymeadow ...". should read "At Alkali Creek (Alternatives 2-4), about 60 acres of natural wetland and 104 acres of irrigated haymeadow ...".

DEIS p. 1, Second column, last sentence: "... Forest Services mining regulations..." should read "... Forest Service's surface use regulations ...".

DEIS p. 2, Second column, last sentence under (1): "... Forest Service's mining, regulation should read "... Forest Service's surface use regulations ...".

DEIS p. 29, second paragraph, first sentence: "Alternative 7 will displace an estimated 1,440 sage grouse and eliminate up to eleven strutting grounds used by these game birds in Chance Gulch." should read; "Alternative 7 will displace an estimated 150 sage grouse and eliminate up to four strutting grounds used by these game birds in Chance Gulch."

DEIS p. 33, first paragraph under Soils: "... in the figure under Wildlife ..." should read "... in the figure under Vegetation ...".

DEIS p. 49, 2nd column, 2nd paragraph: The reference to "Zygnema" is changed to "Zygogonium sp."

DEIS p. 51, first column, last sentence: "Although Alkali Basin is not big game winter range, ..." revised to read "Although Alkali Basin is not critical big game winter range, elk and mule deer feed on south aspects during mild winters (See DEIS p. 149). Elk and deer also migrate through the east end of the basin and along the west ridge of the basin in May and November-December."

DEIS p. 52, second paragraph, 1st sentence: "According to the Colorado Division of Wildlife (CDOW), 11 sage grouse leks lie within 1.9 miles of the Chance Gulch Site." is corrected to "... 4 sage grouse leks..."

DEIS p. 52, first column, last sentence: "...and the Almont Triangle, between the Taylor and East Rivers, providing winter range for elk and mule deer." should read "...and the Almont Triangle, between the Taylor and East Rivers, providing winter range for elk, mule deer and bighorn sheep."

DEIS p. 58, third paragraph under Groundwater: "Figure 3-13 on page 92a" should read "Figure 3-12 on page 92".

DEIS p. 64, first paragraph under AIR QUALITY: "...roads, chimneys, and vehicles" should read "...roads, chimneys, vehicles, and fugitive dust."

DEIS p. 65, second column: The sentence which reads: "Historic sites resulting from late 19th Century mining activity are better known and include the Town of Crested Butte, which was designated in National Historic District on May 29, 1974." Should read: "Historic sites resulting from late 19th Century mining activity are better known and include the Town of Crested Butte, a portion of which was designated a National Historic District on May 29, 1974."

DEIS p. 75, last paragraph: "developemnt" should be "development".

DEIS p. 86, second column, second full paragraph: "The City of Gunnison relies on transferring utility funds, particularly the electric utility funds, to the general fund to help pay for general government expenses." is deleted.

DEIS p. 86, item (2) under Financial Condition: delete the words "do not".

DEIS p. 89, third paragraph under General Government Services: the City of Gunnison employs 64 people, not 23.

DEIS p. 103, first sentence under Molybdenosis: "Through blowing dust and water transport, ...". should read "Through blowing dust, spillage during transportation, and water transport, ...".

DEIS p. 107, second column, last paragraph: "This new demand has been incorporated into long range plans which describe an expanding demand and thus require considerable capital investment to increase generating capacity." should read "...to increase generating and transmission capacity."

DEIS p. 113, first column, 1st paragraph, last sentence: "As long as it will not cause artifact deterioration ...". is deleted.

DEIS p. 129, third paragraph: "A hazard common to all construction projects is the destruction of public land survey monuments and private property corner markers." is revised to read "A risk common to"

DEIS p. 131, last sentence under Energy: "Other than related to ore haulage, no outstanding differences in energy consumption were identified." Should read "Other than related to ore haulage, no outstanding differences in energy consumption were identified between the Coal Creek mine site and the Slate River mine site."

DEIS p. 143, last sentence under Energy: "Other than related to ore haulage, no outstanding differences in energy consumption were identified." Should read "Other than related to ore haulage, no outstanding differences in energy consumption were identified between the Coal Creek mine site and the Slate River mine site."

DEIS p. 149, first two sentences under Wetlands: "Approximately 43 acres of natural wetlands will be covered by the mill site, tailing disposal area, and mill water reservoir. An additional 99 acres of irrigated haymeadow with wetland characteristics will be covered." Should read "Approximately 40 acres of natural wetlands will be covered by the mill site and tailing disposal area. The mill water reservoir will cover approximately 11 acres of wetland. An additional 104 acres of irrigated haymeadow with wetland characteristics will be covered."

DEIS p. 175, first paragraph under Water: delete the word "probably".

Deis p. 190, last sentence under Cultural Resources: Reference to the original Source is added: (Colorado Historical Society, April 13, 1981).

DEIS p. 223, first sentence under Voltage: "...But additional capacity will eventually be needed..." should read "...but additional power will eventually be needed..."

DEIS p. 240, second column, second paragraph: Delete the following sentence: "If landownership adjustments occur in the disposal areas, the uses will be protected by the proponent executing satisfactory documents to ensure continued use."

DEIS p. 241, first column, last paragraph: "There are elk calving and deer fawning grounds on the disposal area." Should read "There are elk calving grounds on the area proposed for disposal classification."

DEIS p. 256, second column, second paragraph: "The electric power used to operate the mining operation, if generated at coal fired plants, could require burning approximately 117,000 tons of coal annually." Should read, "The electric power used to operate the mining operation, if generated at coal fired plants, could require burning approximately 200,430 tons of coal annually."

DEIS p. 311, first impact listed: "Decrease" should be "Decreased".

DEIS p. 348, first sentence under voltage: delete alternative 1.

DEIS p. 415, first reference: "Coloraddo" should be "Colorado".

DEIS p. 415, fourth reference: "andd" should read "and".

DEIS p. 418, twelfth reference: "19779" should be "1979".

DEIS p. 420, fourth reference: "Special1" should be "Special".

DEIS p. 425, third reference: "Mesting" should be "Nesting".

DEIS p. 429: Index addition: Power Supply 34, 35, 36, 40, 41.

CHAPTER 1. PURPOSE AND NEED

CHAPTER ONE. PURPOSE AND NEED

The material in this chapter updates, clarifies, and improves information in Chapter 1 of the DEIS.

PURPOSE AND NEED (DEIS p. 1:
See Errata)

PROJECT SUMMARY (DEIS pp. 1-2: add the following to the discussion on the Plan of Operations.)

AMAX's Plan of Operations covering the Project is discussed on DEIS pp. 1-2. Following publication of the DEIS, AMAX updated the Plan of Operations (AMAX, 1982). No substantial changes in Project design were made. The update brings the reclamation and mitigation plans of AMAX's Environmental Report (AMAX, 1981a) under the Plan of Operations and clarifies the Project schedule, which now has a 1984 startup date. Other indications from AMAX suggest that the startup date is somewhat uncertain.

PROJECT DECISIONS (DEIS p. 3: add the following discussion on issues and decisions not decided through NEPA procedure to the end of the section on Project decisions.)

Certain decisions and issues that have arisen in connection with the Project will not be decided or resolved through NEPA procedure. These are listed below:

(1) AMAX's Right to Mine - The "right to mine" issue focuses on the following question: Does a mining company have the right to use

NFS lands for mining purposes, or does it need permission which can be withheld if the project is not acceptable? The argument has been made that no right to mine exists, that the 1872 mining law was designed for mining operations much smaller than the Mt. Emmons Project, and that the Forest Service can prohibit AMAX from using NFS lands. The various mechanisms available for doing this, according to the argument, include: (a) establishing that a valuable mineral deposit does not exist, and then withholding approval of the Plan of Operations; (b) denying easements and rights-of-way for utility and haulage corridors, using the contention that the Project is not in the public interest; and (c) limiting millsite claim use to one per lode claim, which would not provide enough ground for mine, mill, and tailing disposal.

These arguments are not consistent with Forest Service policy and therefore cannot be resolved through the NEPA process.

(2) is the 1872 Mining Law Outdated? - An issue that arose early during the scoping process dealt with the question: Should the 1872 mining law be changed so that it more accurately reflects today's values? The argument behind this issue is that the 1872 mining law was passed during a time of national emphasis on rapid economic expansion. Environmental values were hardly even recognized during that era. Since then, how-

ever, these values have risen to a level of much higher importance, rendering the 1872 mining law out-of-date. Because of this, some people perceive this law should be updated.

This issue can only be resolved through legislative change, not through an EIS prepared under NEPA for a mining plan of operations.

(3) Non-Federal Decisions - State, county, and local authorities may decide to approve or disapprove certain aspects of the Mt. Emmons Project. Although the disclosure of impacts in this EIS is available to assist these authorities in their decisions, NEPA laws and regulations do not govern these authorities. Each of these authorities must make their decisions in accordance with other applicable laws.

PROJECT HISTORY (DEIS pp. 3-6:
No change)

USES OF MOLYBDENUM (DEIS p. 6:
add the following.)

Additional information beyond that which is referenced can be found in AMAX (1981a, Chapter 3).

MICROFICHE REFERENCE SYSTEM
(DEIS p. 7: add the following.)

DEIS p. 7 stated that all of the material incorporated by reference in the DEIS is in the microfiche reference system. In fact, the system includes other reports as well. A complete list of the reports in the system is in FEIS Appendix L.

CHAPTER TWO. ALTERNATIVES INCLUDING THE PROPOSED ACTION

CHAPTER TWO: ALTERNATIVES INCLUDING THE PROPOSED ACTION

The material in this chapter updates, clarifies, and improves information in Chapter 2 of the DEIS.

INTRODUCTION (DEIS p. 9: no change)

STRUCTURE OF ALTERNATIVES
(DEIS pp. 9-11: add the following.)

The structure of the alternatives analyzed in detail (that is, the way in which their specific components are linked together) is discussed on DEIS pp. 9-11. Briefly outlined, the seven alternatives described in the DEIS play the following roles. Alternative 1 is No Action, meaning the mine is not developed. Alternative 2 is AMAX's proposal. Alternative 3 is the Forest Service version of AMAX's proposal. Alternative 4 minimizes activity in the Coal Creek municipal watershed, but uses the same tailing disposal area as in Alternatives 2 and 3. Alternative 5 uses a tailing disposal area closer to the ore body. Alternative 6 explores opportunities to minimize impacts through a lower production rate and partial burial of transmission lines. Alternative 7 involves a higher production rate and a tailing disposal area near Gunnison.

DESCRIPTION OF ALTERNATIVES
(DEIS pp. 11-27: no change)

COMPARISON OF ALTERNATIVES

PROJECT LAYOUT (DEIS p. 28: the following paragraph com-

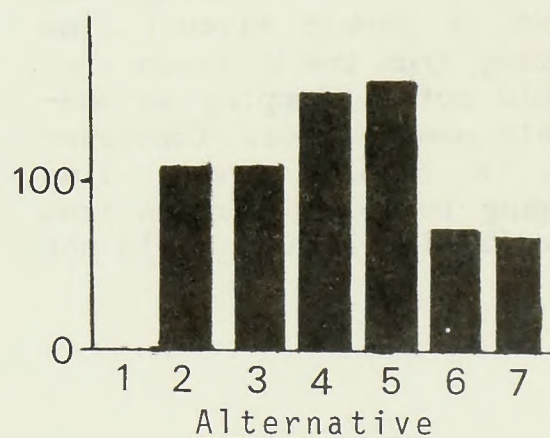
pletely replaces the second paragraph under Project Layout.)

As the No Action alternative (Alternative 1) involves no mine on Mt. Emmons, impacts associated with the alternative relate mainly to ordinary growth in the area.

Vegetation (DEIS p. 28: add the following)

A comparison of riparian disturbances is shown in the following figure. Although this information does not precisely agree with Army Corps of Engineers determinations of wetlands disturbed, it does illustrate the relative magnitude of wetlands affected by the alternatives.

Riparian Acres Disturbed



POWER SUPPLY CONFIGURATION
(DEIS pp. 34-36: no change)

LAND EXCHANGE (DEIS PP. 36-37; no change)

FOREST SERVICE PREFERRED

ALTERNATIVE (DEIS p. 37: No change)

ALTERNATIVES ELIMINATED FROM FURTHER DETAILED STUDY

MINE SITE (DEIS p. 38; no change)

MILL SITE (DEIS p. 38: no change)

ORE HAULAGE (DEIS pp. 38-40: no change)

POWER SUPPLY (DEIS p. 41: add the following topic on double circuit transmission lines to the list of power supply alternatives eliminated from further detailed study.)

Double Circuit Transmission Lines

The discussion about power sources beginning DEIS p. 219 explains that adequate power is not immediately available in the Gunnison vicinity. This being the case, a double circuit line coming from the Gunnison area would not be tapping an adequate power source. Conversely, a double circuit line coming toward Mt. Emmons from the Paonia vicinity would not

resolve the public issue of minimizing impacts in the Kebler Pass corridor. Therefore, and in consideration of the fact that there are many other actions which could make adequate power available in the GCEA Service area (DEIS p. 221), double circuit transmission lines were eliminated from further detailed study.

WORKER ACCESS (DEIS p. 41: no change)

PRODUCTION RATE (DEIS p. 42: no change)

MINING METHOD (DEIS p. 42: add the following topic on backfilling.)

Backfill with Tailing

Backfilling was suggested as a possible method of reducing surface impacts. The technique is not technically feasible in association with the proposed panel caving mining technique.

LAND EXCHANGE (DEIS pp. 42-43: no change)

SCHEDULE (DEIS p. 43: no change)

WORKFORCE ESTIMATES (DEIS p. 43: no change)

CHAPTER 3. AFFECTED ENVIRONMENT

CHAPTER THREE. AFFECTED ENVIRONMENT

The material in this chapter updates, clarifies and improves information in Chapter 3 of the DEIS.

VEGETATION

REGIONAL SETTING (DEIS pp.45-46: no change)

MINE AREAS (DEIS pp.46-47: no change)

MILL AREAS (DEIS pp.47-48: no change)

SENSITIVE AREAS (DEIS p. 49: add the following as a new topic on wetlands.)

Wetlands - As defined by the Army Corps of Engineers (1977), wetlands are: "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands typically include swamps, marshes, bogs, and similar areas." For analyses presented in the Mt. Emmons EIS, the vegetation types considered to have wetland characteristics are: subalpine willow, wet sedge meadow, riparian willow, moist meadow, cottonwood, and sphagnum-sedge bog. A map of the wetlands of the Project area can be found in AMAX (1981a,b) and CDM (1981b).

The generally recognized functions and cultural values of wetlands were described by Reppert et. al. (1979) as:

(A) Primary Functions: (1) food chain production, (2) general and specialized habitat for land and aquatic species, (3) aquatic study areas, sanctuaries, and refuges, (4) hydrologic support function, (5) shoreline protection, (6) storm and flood water storage, (7) natural groundwater recharge, and (8) water purification; and

(B) Cultural Values: (1) commercial fisheries, (2) renewable resources and agriculture, (3) recreation, (4) aesthetics, (5) and other special values.

For any given wetland, some of the functions or values may not occur. For example, no wetlands in the Project area are recognized as aquatic study areas, sanctuaries, refuges or commercial fisheries. In addition, the specific functions or values that do occur are not always high in relative efficiency or importance. For example, an evaluation of the wetland functions and values in Alkali Basin determined that, overall, these factors were relatively low (CDM, 1981b). The primary value and function of this wetland is for irrigated hay pasture production for cattle grazing.

THREATENED AND ENDANGERED SPECIES (DEIS p.50: no change)

WILDLIFE (DEIS pp. 50-53: See Errata)

AQUATIC ECOLOGY

MINE AREAS

Coal Creek (DEIS p. 53: the end of the first paragraph, second column is corrected to read as follows.)

The June, 1981 startup of a heavy metals treatment plant has brought this pollution under control and improved the aquatic environment. A fishery has been reestablished (CDM, 1981e).

MILL AREAS (DEIS pp. 53-54: no change)

ENERGY (DEIS pp. 54-56: no change)

WATER (DEIS pp. 56-63: See Errata)

AIR (DEIS pp. 63-64: See Errata)

NOISE (DEIS pp. 65: add the following paragraph at the end of the Noise section.)

Gunnison County disagrees with the baseline noise levels described for the Town of Crested Butte (Figure 3-5, DEIS p. 65); it believes the baseline level is 25dB.

CULTURAL RESOURCES (DEIS: See Errata)

VISUAL RESOURCES (DEIS pp. 66-68: no change)

OUTDOOR RECREATION (DEIS pp. 68-73: no change)

FIRE (DEIS p. 74: no change)

TRANSPORTATION (DEIS pp. 74-75: no change)

SOCIOECONOMICS

HISTORICAL BACKGROUND (DEIS pp. 75-76: no change)

LAND OWNERSHIP (DEIS p. 76: no change)

SOCIETY (DEIS pp. 76-78: no change)

INCOME AND EMPLOYMENT (DEIS pp. 78-80: no change)

RETAIL SALES (DEIS p. 81: no change)

ASSESSED VALUATION (DEIS p. 81: no change)

HOUSING (DEIS p. 83: add the following updated information.)

Gunnison County Housing Authority has cancelled its low income project, and the City of Gunnison has adopted new subdivision regulations. New utility regulations and the new zoning code are still being developed.

INDUSTRY (DEIS p. 84: no change)

LOCAL GOVERNMENTS (DEIS pp. 84-90: no change)

GEOLOGY (DEIS pp. 90-94: no change)

SOILS (DEIS p. 94: no change)

LAND USES (DEIS pp. 95-96: no change)

AVALANCHE HAZARDS (DEIS p. 97: no change)

CHAPTER 4. ENVIRONMENTAL CONSEQUENCES

CHAPTER FOUR. ENVIRONMENTAL CONSEQUENCES

The material in this chapter updates, clarifies, and improves information in Chapter 4 of the DEIS.

GENERAL IMPACTS

(DEIS p. 100: the following paragraph is to be added at the end of the introductory remarks of Chapter 4.)

The impacts of the No Action alternative (Alternative 1) are discussed at appropriate points throughout this chapter. Additional discussion can be found throughout Chapter 3.

VEGETATION (DEIS pp. 101-104: no change)

WILDLIFE (DEIS pp. 104-106: no change)

AQUATIC ECOLOGY (DEIS p. 106: no change)

ENERGY (DEIS pp. 106-108: no change)

WATER

Direct Impacts - (DEIS p. 108: the following is added to the discussion on accidental toxic spills.)

The risk of a spill entering live water is considered low because only a very small percentage of total haul distances will be in close proximity to live water. The impact of such a spill may be adverse to aquatic life, depending on the amount and type of substance spilled.

Indirect Impacts - (DEIS p. 109: no change)

Acid Drainage - (DEIS pp. 109-110: the following is added to the discussion on acid drainage from Mt. Emmons.)

The statment on DEIS p. 109 that "No proposals for control have been made..." refers only to detailed, site-specific plans. The development of such plans at this time is premature.

Mitigation of acid drainage may be accomplished through prevention (Snow, 1980), or through treatment of mine drainage (DEIS, p. 277). Both strategies will be expensive. Prevention will entail considerable hydrologic analysis and grouting of underground workings. Future treatment costs cannot be predicted, but the existing heavy metals water treatment plant (2,000 gallon per minute capacity) cost \$12 million to construct and operates on an annual budget of \$1 million. Costs of treating acid Mt. Emmons mine water would probably exceed these figures.

Technically, there are reasonable prospects for successful control, especially when the time available for preparation is so great.

In the unlikely event that mitigation fails and acid drainage develops, a worst-case situation will ensue. This will consist of renewed pollution of lower Coal Creek with acid and heavy metals. The Town of Crested Butte's water supply may be affected. Aquatic life in the affected reaches will probably disappear, much as during the period when Keystone Mine

effluent was entering Coal Creek. Elk Creek and Oh-Be-Joyful Creek will probably not be affected because the easiest exit points will be via the mine workings in the Coal Creek drainage. The effects of acid drainage may persist downstream into the Slate and East Rivers, but dilution will markedly reduce acidity and heavy metal concentrations.

"Clean Up Coal Creek Project" - (DEIS p. 110: the following is new information on this topic).

Following publication of the DEIS, new information became available (CDM, 1981e) indicating that the lower reaches of Coal Creek are once again supporting fish.

Water Rights - (DEIS p. 110: no change)

Water Consumption - (DEIS p. 110: this topic is to be added as a new section.)

Estimated annual water consumptive use for the Project will be about 3,000 acre-feet. During typical water years, the bulk of this water is expected to be diverted under junior water rights during periods of high flow, with only minor contributions coming from water diverted under senior water rights. Therefore, the permanent cessation of irrigation due to the Project is expected to be insignificant.

During drought (worst-case) conditions, however, a more noticeable area may have to be taken out of irrigation on a temporary basis. If senior water rights were to provide 3,000 acre-feet of water, then 1,587-2,655 acres would be taken out of produc-

tion for the year. This range of acres is based on the differing estimates of consumptive use reported in Kruse and Haise (1974) and SCS (1978). The acres involved will be in the Gunnison Basin, but their exact location is not known at this time. For the following reasons, it is not expected that all of the acres will be taken out of production during any given season: (1) drought years are infrequent; (2) a sharing of irrigation waters may be arranged; and (3) stored water from the previous year may reduce a single year's water diversions below 3,000 acre-feet.

AIR (DEIS pp. 110-112: no change)

NOISE (DEIS p. 112: no change)

CULTURAL RESOURCES (DEIS pp. 112-113: the following material replaces the section on cultural resource impacts; several minor revisions have been made.)

Cultural Resource Impacts
Five types of adverse impacts on cultural resources are possible:

(1) Destruction or alteration of all or part of the resource. Such direct impacts would affect all resources located in construction areas.

(2) Isolation from or alteration of the resource's surrounding environment. Such direct impacts could affect all Class I and II resources (see glossary) in or adjacent to construction areas.

(3) Introduction of visual, audible or atmospheric elements that are out of character with the resource or

alter its setting. Such direct and indirect impacts could affect Class I historic resources in the general vicinity of the Project. They would not likely affect Class I prehistoric resources, unless they have been developed for educational or recreational purposes, or any Class III resources.

(4) Neglect of a resource resulting in its deterioration or destruction. Such indirect impacts would affect mostly Class I and II historic resources. Class III historic resources are generally already deteriorated and prehistoric resources are not generally subject to deterioration through neglect. Vandalism resulting from failure to protect avoided resources could result in damage to all resources.

(5) Transfer or sale of a property without adequate conditions or restrictions regarding preservation, maintenance, or use. Such indirect impacts could affect all resources located in land exchange areas. All land exchanged will require complete survey and all located sites will require mitigation before an exchange can occur. Direct impacts to cultural resources are most likely to occur during the construction phase of the project with some indirect impacts possible during the operation phase. Impacts due to vandalism from increased use of the area may occur at all stages of the Project. The Forest Service preferred method of cultural resource protection is avoidance. This is effective for most direct and indirect impacts but is not always practical. Avoidance cannot

be assured on lands to be exchanged to private owners when control of the resources would no longer rest with the Forest Service.

Prior to any ground-disturbing activity, a cultural resource examination will be performed on any unsurveyed land and a mitigation plan developed in consultation with the State Historic Preservation Office and the Advisory Council on Historic Preservation. The Forest Service will require implementation of this plan only on NFS lands.

As an ongoing part of its responsibility to comply with Section 106 of the National Historic Preservation Act, and Section 2(b) of Executive Order 11593, the Forest Service has begun consultation with the State Historic Preservation Officer regarding the National Register status of 664 cultural resources located in the Project area. By February 22, 1982 there was agreement on the status of all 664 of these resources. Evaluations on additional located resources will be submitted in the near future. Of the 664 resources 18 were considered eligible for the National Register of Historic Places, 485 were considered ineligible, and more information is needed to evaluate the remaining 161. Of the resources clearly eligible, 14 could be directly impacted by either Project development or land exchange. The number of resources affected would vary depending on the mill site chosen (AMAX, 1981a, pp. 4-106 to 4-112).

The Forest Service will continue to carry out its cultural resource responsibilities, including the prepara-

tion of a proposal for inclusion in a memorandum of agreement that details the actions to be taken to avoid, satisfactorily mitigate, or accept adverse effects on specific resources located on NFS land.

Potential Impacts on the
Crested Butte National His-
toric District (DEIS pp.
113-114: no change)

VISUAL RESOURCES

General (DEIS pp. 114-
115: no change)

Subsidence (DEIS p. 116:
The last sentence of the next
to the last paragraph under
this topic is revised as
follows)

Inventoried VQO's will
not be met during the six
months of the year that the
ground is not snow-covered.

"Degreening" - (DEIS p.
116: this topic is to be
added as a new section.)

A possible impact related
to the Project is "degreen-
ing", the drying out of hay-
meadow vegetation when irriga-
tion waters are withheld. The
magnitude of this impact is
expected to vary from year to
year, but under average condi-
tions it should be insignifi-
cant because AMAX is expected
to obtain most of its water
through junior rights. This
water is not currently being
used for irrigation.

Under drought (worst-
case) conditions, AMAX may
have to obtain all of its
water through senior rights,
and this could remove an
estimated 1,587-2,655 acres
from irrigation. Even in a
single growing season, as many

as half of the affected plants
may die, and this will result
in a significant browning of
the affected pastures. The
likelihood of this is low, as
discussed on FEIS page 8. The
color contrast between irrigat-
ed and non-irrigated pastures
will vary according to soil
depth, plant tolerance, and
summer rainfall patterns.

OUTDOOR RECREATION (DEIS pp.
116-121: no change)

FIRE (DEIS p. 121: no
change)

TRANSPORTATION (DEIS p. 123:
the following is to be added
to the discussion on acci-
dents.)

If 'shift-change' traffic
coincides with school bus
schedules, accidents may be
multiplied by the aggravation
of slow, stop and go traffic.

SOCIOECONOMICS

General (DEIS pp. 124-
125: no change)

Social Impact (DEIS p.
125: the following is to be
added following item 5.)

The construction housing
facility proposed by AMAX
(DEIS p. 266-267) will serve
to substantially offset these
conditions.

Impacts on Public Service
(DEIS p. 126: no change)

Local Economic Impacts
(DEIS p. 126: no change)

AMAX Costs (DEIS p. 126:
no change)

GEOLOGY (DEIS pp. 126-127:
no change)

SOILS (DEIS p. 127: no
change)

LAND USES

Urban, Suburban, Commercial, Industrial (DEIS p. 128: The following sentence is added at the end of this discussion.)

At times, the construction or operation of the Project may either conflict with or enhance existing or future uses of private land.

AVALANCHE HAZARD (DEIS p. 129: no change)

MINE SITE

COAL CREEK MINE SITE

Coal Creek Mine Site Impacts

Aquatic Ecology (DEIS p. 131: the following is to be added to the aquatic ecology discussion.)

The probability of this worst-case event is unlikely.

Air (DEIS p. 133: the following is to be added to the end of the air discussion.)

In provisionally issuing its air emission permits for the Coal Creek Mine site, the Colorado Air Pollution Control Division specified that AMAX demonstrate compliance with applicable air quality standards using a numerical model which was being developed under AMAX's guidance at the time. This work was completed and is described in CDM (1982a), which is incorporated by reference. Support docu-

mentation is in CDM (1982b) and Peterson and Cermak (1980), which are also incorporated by reference. The result of this modelling effort indicates that ambient concentrations will be substantially lower than those listed in Table 4-11 (DEIS p. 135).

Worker Access to the Coal Creek Mine Site (DEIS pp. 138-141: no change)

SLATE RIVER MINE SITE
(DEIS pp. 142-148: no change)

MILL SITE

ALKALI CREEK MILL SITE

Alkali Creek Mill Site Impacts

Wildlife

Elk and Deer (DEIS pp. 149-152: no change)

Sage Grouse (DEIS p. 152: no change)

Threatened and Endangered Species (DEIS p. 152: the following two paragraphs replace the first two paragraphs under Threatened and Endangered Species.)

The construction of a mill and tailings pond in Alkali Basin could remove an undetermined portion of the feeding habitat for bald eagles wintering on the East River. However, since there is no documentation of eagles feeding or hunting in Alkali Basin, this loss of feeding habitat is a remote possibility.

The combination of increased vehicular traffic and increased carrion along Highway 135 could increase the probability of car-eagle collisions. However, this phenomenon is so rare in the Project area, even on more travelled highways, that the probability is estimated to be very low.

Water - (DEIS p. 154: the following discussion is added to the end of the discussion on Roaring Judy Fish Hatchery.)

The Forest Service considers the risk of this to be low, whereas the Department of the Interior feels that it is high. Should uncontrollable leakage occur, interceptor wells fail to extract all of the contaminated water, and supplemental East River water not be suitable or available for hatchery use, a worst-case will arise and the hatchery will no longer be able to function as a trout rearing unit.

Pages 108-109 of the DEIS indicate a low risk for toxic spills at the Alkali Creek mill site to adversely impact the Roaring Judy Fish Hatchery. This is a Forest Service assessment of risk; it is based on AMAX's plans to design a mill/tailing complex that does not discharge water or other fluids off of the property. These plans include measures to place berms around areas where toxic materials are stored and used. The Colorado Division of Wildlife disagrees with this assessment; it feels the risk of damage to Roaring Judy Fish Hatchery is high.

Ore Haulage to the Alkali Creek Mill

Aquatic Ecology (DEIS p. 163: the following is to be added to the discussion on aquatic ecology.)

During culvert installation it is likely there will be changes in fish and macro-invertebrate populations immediately downstream. These changes are expected to be short term and recovery will be rather quick.

It is possible for the culverts described above to become barriers to upstream fish migration. The principal cause of this barrier is stream velocity through the culvert, increasing beyond a speed against which fish can swim. This potential impact can be mitigated with proper design. Measures in Table B-1 (FEIS p. 161) should adequately mitigate this impact.

Water (DEIS p. 165: add the following to the end of the water discussion.)

Pages 163-165 of the DEIS discuss the water impacts of ore haulage to the Alkali Creek mill. Two prominent features along the Carbon Creek haulage route are the Carbon Creek fill and the Coal Creek fill. The following paragraphs discuss the leaching potential of these two fills:

Carbon Creek fill - Rock types to be excavated from the Mt. Axtell Tunnel are described in DeLong and Stewart (1979). Briefly, these are dominated by sandstones of the Mesa Verde and Ohio Creek formations, and igneous rock associated with the Mt. Axtell intrusion. These rocks are not expected to cause leaching

problems when placed as fill for the Carbon Creek crossing. Nearly all of the fill will be placed above the ordinary high water mark.

Coal Creek fill - Rock types to be excavated from the Mt. Emmons ore haulage tunnel are shown graphically in Figure 3-12 (DEIS, p. 92) and include sandstones of the Mesa Verde Group, Mancos Shale, and igneous rock. Discussion with AMAX geologists indicates that an aureole of contact metamorphism surrounds the Mt. Emmons intrusion and includes the haulage tunnel location. Within this aureole, the Mancos has been recrystallized into a hornfels having considerably less potential for causing salinity problems than does unaltered Mancos Shale. Nearly all of the fill will be placed above the ordinary high water mark.

The generation of acid drainage by the Coal Creek fill is not expected to occur for the following reasons: (1) fill material will not contain significant pyrite or other sulfide minerals; (2) the time available for significant leaching will be limited by the porous nature of the fill, which will permit rapid pass-through of percolating waters; (3) water passing through the fill will come mainly from rainfall and snowmelt on the fill's 40-acre surface, which accounts for 2.1% of the municipal watershed's 1,876 acres; and (4) AMAX's reclamation plan (DEIS p. 298) calls for removal of the fill, which means it will not remain in place in perpetuity. The Department of the Interior disagrees with this assessment; it believes the risk of acid drainage by the fill to be high.

Transportation (DEIS

p.168: add the following to the end of the transportation discussion.)

An aspect of permitting public access along the railroad access road that was not discussed in the DEIS (pp. 167-168) pertains to public safety. AMAX has requested exclusive use of the access road. If exclusivity is granted, risks to public safety will be low. If public access is permitted, there will be a continual risk of accidents along the haulage route.

(DEIS p. 169: the following is to be added to the end of the discussion on ore haulage to the Alkali Creek mill, after avalanche hazard.)

In discussing strategies for mitigating the impacts of the Coal Creek fill, DEIS page 252 mentions the possibility of using a fill no larger than that needed for equipment and supplies during tunnel construction. The impacts of this option were not analyzed in the DEIS; they are presented in the following paragraphs. (For the purposes of this discussion, it is assumed that the fill covers a total area not exceeding 3 acres and is not over 30 feet in height above the creek bottom.)

Vegetation impacted involves a maximum of 3 acres, including subalpine meadow, Engelmann spruce/subalpine fir forest, and riparian willow thicket. Less than one-tenth acre of wetland will be covered. These impacts are substantially less than the 40 acres of vegetation and 2 acres of wetland involved in Alternatives 2 and 3, but somewhat greater than those involved in Alternative 7.

Wildlife impacts will be negligible.

Aquatic ecology impacts will be minor. Fish movement in an upstream direction may be somewhat impeded (by a maximum culvert length of 600 feet), but the risk of upstream movement being prohibited is much less than under Alternatives 2 and 3. No such risk will occur under Alternative 7.

Water impacts will consist of temporary increases in suspended sediment similar to those discussed on DEIS pages 163-164 and 251. The risk of sediment increases will be less than under Alternatives 2 and 3 because of the smaller area disturbed, but more than under Alternative 7.

Air impacts will consist of minor fugitive dust.

Noise impacts will be intermediate between those of Alternatives 2-3, and Alternative 7.

Cultural resource impacts will be negligible.

Visual resource impacts will be less than those expected under Alternative 2 and 3. By affecting only 3 acres instead of 40 acres, the fill will generate less visual contrast along the Coal Creek valley bottom. The top of the fill will be below the present elevation of the Kebler Pass road in the vicinity of the crossing. However, the visual impacts of the fill will still be greater than those of the trestle of Alternative 7.

Impacts on outdoor recreation will be minor. Approximately 2,700 more feet of Coal Creek channel will be available for fishing under Alternatives 2, 3.

Fire risks will be negligible.

Transportation impacts will be similar to those expected under Alternatives 2, 3, and 7. Traffic along the Kebler Pass road will have to be routed around construction activities in all cases.

The capital cost of a smaller fill will be greater than that of the larger fill of Alternatives 2 and 3, and less than the trestle of Alternative 7. The total capital cost of constructing a trestle and hauling the waste rock to the mine site is estimated to be nearly \$5 million, whereas the capital cost of installing the larger fill is estimated to be \$1 million to \$2 million. The capital cost of the smaller fill and associated haulage is estimated to be \$2 million to \$3 million. Additional costs will be incurred at the close of the Project when the fill material is removed from Coal Creek.

The smaller fill will be large enough to provide a staging area for construction of the ore haulage tunnel into Mt. Emmons. If a trestle were used instead, no convenient space would be available to store equipment and supplies needed for tunnel construction. Settling basins for water discharged from the tunnel may also be needed; they would be easier to install and operate on fill material than on a trestle.

Geologic impacts will be negligible.

Soil impacts will be substantially less than under Alternatives 2 and 3, and slightly more than under Alternative 7.

In terms of land uses, less land would be converted to industrial use for the

smaller fill than would be the case for the larger fill associated with Alternatives 2 and 3.

Avalanche hazards will not be affected by the smaller fill.

Worker Access to the Alkali Creek Mill (DEIS pp. 169-163: no change)

CARBON CREEK MILL SITE (DEIS pp. 173-185: no change)

CHANCE GULCH MILL SITE

Chance Gulch Mill Site
Impacts

Wildlife

Elk and Deer (DEIS pp. 186-187: no change)

Sage Grouse (DEIS p. 187: the following is to be added following the first sentence in the section on sage grouse.)

The Colorado Division of Wildlife, however submitted data in its comments on the DEIS indicating that the sage grouse population in Chance Gulch is probably closer to 200 birds, while the Department of the Interior estimates a population of about 150 birds.

PRODUCTION RATE

VEGETATION (DEIS pp. 200-201: no change)

WILDLIFE (DEIS p. 201: no change)

AQUATIC ECOLOGY (DEIS p. 201: no change)

ENERGY (DEIS pp. 201-203: no change)

AIR QUALITY (DEIS pp. 203-208: no change)

NOISE (DEIS p. 208-209: no change)

CULTURAL RESOURCES (DEIS p. 209: no change)

VISUAL (DEIS p. 209: no change)

OUTDOOR RECREATION (DEIS p. 209: no change)

FIRE (DEIS p. 209: no change)

TRANSPORTATION (DEIS p. 209: no change)

SOCIOECONOMICS (DEIS p. 209: the following introduction is to be placed at the beginning of the section on socioeconomics.)

Introduction As discussed on DEIS pages 77-78, Gunnison County has experienced considerable population growth in the past 10 years. As a result, agencies of local government have already developed procedures to deal with growth and are in a comparatively good position to manage rapid population increases associated with the Project. Each local government has a full-time manager and one or more full-time planners. In addition, the socioeconomic studies conducted by BMML (BMML 1980a,b; 1981a-d) have established a comprehensive information base covering possible growth impacts and mitigation strategies. This information base puts local governments in a good position

for preparing and planning for growth, rather than simply reacting to it as it occurs.

Mitigation of socioeconomic impacts will have to take many forms. Appendices A and B (DEIS pp. 261-300, 301-326) list a number of these, with a fuller discussion being available in BML (1981a-d). Successful mitigation is possible in all instances, but it hinges on effective preparation. Local governments are already accustomed to functioning in an atmosphere of comparatively rapid growth. In addition, AMAX has indicated a willingness to assist in this preparation, by providing technical assistance to local governments, by making available necessary funding in advance of the usual revenue-formation process, and by taking steps of its own to help create new housing in a timely manner. With this assistance, it appears probable that successful mitigation of socioeconomic impacts can be achieved.

An important assumption underlying the socioeconomic analyses is that growth pays its own way. This assumption was made through discussion between BML and representatives of local government. It is intended to minimize the burdens borne by local governments of capital costs associated with new growth, shifting the burden instead to those who are part of the new growth.

DEIS p. 210 indicated that a system of monitoring growth will be needed to 'fine tune' community responses to development pressures. During the interval following publication of the DEIS, the details of this monitoring

system have largely been worked out (BML, 1982). This was accomplished cooperatively between AMAX, representatives of local government, and the Forest Service.

Population (DEIS p. 210: no change)

Spatial Allocation (DEIS pp. 210-213: no change)

Social Effects (DEIS p. 214: the discussion on trade-offs is deleted.)

Housing (DEIS p. 215: The following is to be added to the end of the housing discussion.)

Under Alternative 6, mine closure will occur within 12 years of the rapid growth period. This may discourage mortgage institutions from making conventional loans for housing, which could lead to a relatively higher proportion of temporary types of housing, such as mobile homes.

Schools (DEIS p. 215: no change)

Public Services (DEIS p. 215: no change)

General Government (DEIS pp. 215-216: no change)

Fiscal Impacts (DEIS pp. 216-218: no change)

AMAX Costs (DEIS p. 218: no change)

Mine Closure (DEIS pp. 218-219: no change)

Tradeoffs (DEIS p. 219: this is to be added as a new section; it is to be placed at the end of the discussion on socioeconomics.)

TABLE 4-50a. TAX REVENUES IN 1994, AS AN INCREASE ABOVE 1980 LEVELS*

	Production Rate, Tons Per Day			
	No. Action	10,000	20,000	30,000
Sales Tax	\$1.4	\$2.2	\$2.7	\$3.0
Property Tax	2.5	6.2	8.0	9.9
Use Tax	.5	.5	.6	.6
	<u>\$4.4</u>	<u>\$8.9</u>	<u>\$11.3</u>	<u>\$13.5</u>

*In millions of 1980 dollars; includes revenues projected for Gunnison County, Mt. Crested Butte, Crested Butte, and Gunnison.

Source: BMML(1981b,c,d)

The discussion on Socio-economics indicates that rapid growth will occur under Alternatives 2-7, with only minor differences resulting from various production rates when compared to the No Mine alternative. This growth entails the promise of important benefits and the risk of serious problems, as discussed below.

The major local benefits that could result from the Project are an increased tax base to support increased government services, and an increase in the variety and quality of goods and services available to consumers. Estimated Project-induced tax revenues for the year 1994 are listed in Table 4-50a. These are indicative of the revenue levels that can be expected throughout production. With an expansion in the local

economy, a greater variety of goods and services will be available locally. These include not only household and entertainment items, but also a greater variety of health and medical services. As this occurs and local retailers are better able to compete price-wise with the markets in larger population centers, the capture rate of local incomes should increase.

On a broader scale, the nation's production of molybdenum will be enhanced and a certain amount of new basic employment will be created.

As this economic expansion takes place local economic stability will increase, but it will not be without its risks. Even with AMAX's major capital investment and its consequent desire to keep the mine operating to recoup its expenses, there will be a risk

of employee reductions during major down cycles in the steel industry. AMAX has been relatively immune to such contractions in the past, but it has recently had to cut back on production and employees as a result of the current worldwide recession in the steel industry. This may or may not be repeated in the future, but if it is and the Mt. Emmons mine has to lay off employees, the Gunnison County area will likely experience a period of relatively high unemployment and reduced local government revenues. Periods of this nature, if they occur at all, will probably be spaced several years apart. During the intervening years of stable production, the mine's influence on the local economy will tend to even out the seasonal fluctuations that currently accompany tourism and recreation.

If all mitigation efforts are successfully implemented, growth stimulated by the Project will be smoothly accommodated, resulting in stable, cohesive communities and a local economy that has mining and recreation operating compatibly side by side. If all mitigation fails, then another example of the 'boom-town' syndrome will occur as a worst-case situation. As indicated in the Introduction to this section on Socio-economics, success is more likely to occur than failure.

GEOLOGY (DEIS p. 219: no change)

SOILS (DEIS p. 219: no change)

LAND USES (DEIS p. 219: no change)

AVALANCHE HAZARDS (DEIS p. 219: no change)

POWER SUPPLY (DEIS pp. 219-236: no change)

LAND EXCHANGE

GENERAL SELECTED LAND IMPACTS (DEIS p. 237: the second paragraph is replaced with the following)

National Forest System lands occupied under permits or easements will ordinarily not be exchanged unless the Non-Federal owner and the permittee reach agreement on the disposition of the existing use. If agreement cannot be reached and completion of the exchange is in the public interest, the permit may be terminated and the exchange completed.

LAND CLASSIFICATION (DEIS pp. 239-248: See Errata)

OTHER IMPACTS

LOCAL SOURCE MATERIALS (DEIS pp. 248-249: no change)

POTABLE WATER (DEIS pp. 249-251: no change)

COAL CREEK WATERSHED (DEIS pp. 251-252: no change)

THE RELATIONSHIP BETWEEN SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Aquatic Ecology (DEIS p. 255: The following is added following the wildlife discussion.)

If maximum reservoir storage capacity is constructed the following long-term effects on aquatic ecology will occur.

Alternative one would create no major long-term changes in aquatic ecosystems.

Alternatives 2, 3, and 4 would convert the following approximate stream distances from stream ecosystems to reservoir ecosystems; 2125 feet of Carbon Creek, 1400 feet of Elk Creek and 3,000 feet of Alkali Creek. In addition, about 2 miles of Alkali Creek would be covered by tailings with the flows diverted through interceptor conduit.

Alternative 5 would convert approximately 1400 feet of Elk Creek from stream ecosystem. In addition, about 2 miles of Carbon Creek would be covered by tailings with the flows diverted through interceptor conduit.

Alternative 6 would convert approximately 1400 feet of Elk Creek from stream ecosystem to reservoir ecosystem. In addition, about one-half mile of Carbon Creek would be covered by tailings with the flows diverted through interceptor conduit.

Alternative 7 would convert approximately 2125 feet of Carbon Creek and 1400 feet of Elk Creek from stream ecosystems to reservoir ecosystems.

The above long-term changes are not expected to significantly affect long-term productivity.

Land Use (DEIS p. 254: the following material replaces the DEIS discussion on the land use topic.)

In the short-term, approximately 3,000 to 5,000 acres of land will be changed from open space and grazing uses to residential and industrial uses. In the long-term, 600 to 1800 acres will probably remain in residential and ancillary uses while the balance of the disturbed areas, 2400-3200 acres, will be returned to open space and grazing uses. The majority of the area returned to open space will be land reclaimed under the direction of the Forest Service or the Colorado Mined Land Reclamation Board. It is most likely that only 720 acres will remain unreclaimed and consist primarily of the subsidence area and the reservoirs left in service.

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Vegetation (DEIS p. 255: The following is added to the vegetation discussion.)

There is a moderate to high probability that the Mt. Emmons Iron Bog will dry up and be replaced by another vegetation community. However, if intensive studies are completed prior to the time that the water table would be affected, much of the ecological, scientific, and educational values of the Bog could be captured.

CUMULATIVE IMPACTS (DEIS p. 256: no change)

CONFLICTS WITH POLICIES AND PLANS

(DEIS p. 256: the following discussion on conflicts with policies and plans is to

be added as a new section at the end of Chapter 4.)

The CEQ requires discussion of possible conflicts between the proposed action and the objectives of Federal, regional, State and local land use plans, policies and controls for the area concerned. To the extent the Forest Service is aware, and to the extent the responsible authorities identified them in their comments on the DEIS, the following discussions address possible conflicts.

Federal

Land use on NFS lands in the project area is presently directed by two plans.

(1) The East River Land Management Plan lists 17 specific management objectives to be met for the unit (Forest Service 1979c). The proposed action would clearly meet 15 of the 17 objectives. Possible conflicts occur with two of the objectives:

(a) Fisheries (maintain existing quality and quantity): Within the planning unit, the proposed action would put approximately 3,300 feet of Coal Creek in a pipe, thus reducing the quantity of fisheries by this amount.

AMAX proposes to mitigate this conflict by restoring fishery habitat in lower Coal Creek, participating with Trout Unlimited in stream improvement projects for public fishing, and coordinating with ODOW and Trout Unlimited. Additionally, the land exchange proposed by AMAX would add more than 3,300 feet of fishable streams to NFS lands in Colorado.

(b) Range (provide forage for domestic grazing capable of sustaining 14,395 AUM's): Within the planning unit, the proposed action would reduce NFS grazing capacity as a result of Project construction and land exchange.

It should be noted, however, that: (1) within Colorado the net grazing capacity on NFS lands would be increased by the proposed land exchange, and (2) AMAX proposes to allow grazing on its private lands where it does not conflict with Project operations.

(2) The Gunnison National Forest Multiple Use Management Plan directs NFS land use considerations in the Ohio Creek Valley. Management direction in this plan for streamside areas includes: (a) protecting and improving fish and wildlife habitats, and (b) providing optimum recreation opportunities and aesthetic values, consistent with soil and water needs. The ore haulage railroad and fill area in Carbon Creek conflict with this direction.

A land use closure has been issued by the Forest Service to protect Crested Butte's municipal watershed from recreation-related pollution. This closure was not designed to address pollution sources which might be introduced by the Mount Emmons Project.

State

No conflicts have been identified with Colorado land use plans or policies. However, the Colorado Division of Wildlife has issued a compre-

hensive management plan for Colorado's Wildlife (CDOW, 1977). For elk populations, this plan's statewide goal is a slow increase of about 15 percent over 20 years. The reduction in elk population discussed as a possible impact of the Mount Emmons Project appears to conflict with this statewide objective. However, a recent EIS analyzing live-stock grazing in the Gunnison Basin (BLM, 1980) proposed a 5.4 percent reduction in wildlife grazing capacity which the CDOW supported.

County

A possible conflict with the Gunnison County land use resolution has been identified: some of the lands to be used for Project operations are not currently classified for industrial uses. This classification can be changed with the approval of the Board of County Commissioners. AMAX began the process of applying for a land use change permit, but on May 27, 1982 contacted the Gunnison County Commissioners and requested a suspension of processing until more definite scheduling information is available.

Cities

No conflicts have been identified with either the City of Gunnison's or the Town of Crested Butte's land use controls. The Town of Crested Butte has issued resolution No. 1, series 1982, resolving that the development of the Mount Emmons Project should not proceed as proposed and that the Town endorses the No Action alternative at this time as best serving the needs of its citizenry.

REGULATORY COMPLIANCE

(DEIS p. 256: the following discussion on regulatory compliance is to be added as a new section at the end of Chapter 4.)

This section summarizes steps that have been taken to comply with the laws and executive orders listed below:

Federal Clean Air Act - The Air Pollution Control Division of the Colorado Department of Health has issued provisional air emission permits to AMAX for emissions at the mine and mill areas. Analyses based on expected emissions indicate compliance with National Ambient Air Quality Standards.

The Environmental Protection Agency has determined that a Prevention of Significant Deterioration permit will not be required.

Federal Clean Water Act - The Water Quality Control Division of the Colorado Department of Health has issued a National Pollutant Discharge Elimination System permit to AMAX for discharges associated with the Keystone Mine and heavy metals treatment plant.

AMAX has applied to the Army Corps of Engineers for Section 404 Dredge and Fill permits covering 11 project facilities (AMAX, 1981b). The Corps issued public notices regarding the applications, but on June 4, 1982 AMAX contacted the Corps and requested that it suspend processing of AMAX's applications until more definite scheduling information is available.

Endangered Species Act of December 28, 1973 (87 Stat.

884; 16 U.S.C. 1531, 1532, 1536, 1540) and Fish and Wildlife Coordination Act of March 10, 1934 (48 Stat. 401, as amended; 16 U.S.C. 661-667(e); 48 stat. 401, as amended). The Forest Service began informal consultation with the Fish and Wildlife Service (F&WS) in September, 1979 by holding a joint meeting in Gunnison to advise the agency of the nature and location of the proposed Mt. Emmons Project.

The Forest Service requested that F&WS provide, and subsequently received, a list of endangered, threatened, or proposed species which might be within the Project area. The Forest Service then prepared a comprehensive biological assessment which, accompanied by the DEIS, was submitted to F&WS with a conclusion of no effects. The F&WS subsequently concurred, thus meeting the requirements of the act.

Discussions with the Colorado Division of Wildlife were carried out both through the Colorado Joint Review Process and directly with local officials. Discussions continued through the preparation and release of the DEIS.

Following the release of the DEIS, the F&WS submitted a "Fish and Wildlife Coordination Report on the Proposed Mount Emmons Project Proposal and Its Alternatives". This Report is included in the FEIS as Appendix K.

The Forest Service is required to give wildlife conservation equal consideration in the final decisions for the Mount Emmons Project.

The National Historic Preservation Act 1966, as amended

(16 U.S.C. 470), Executive Order 11593, May 13, 1971, "Protection and Enhancement of the Cultural Environment" (36 FR 8921, 16 U.S.C. 470); and Regulations for Protection of Historic and Cultural Properties, (36 CFR 800.1-800.15) - Early in project planning, AMAX submitted plans for, and conducted inventories to gather, information on historic and cultural properties that may be impacted by the Project and its alternatives. Studies of varying intensities covering approximately 150,000 acres culminated in numerous reports being submitted to the Forest Service and the State Historic Preservation Officer (SHPO). These reports are discussed and referenced in various places in the DEIS as well as in AMAX (1981a). During this same time period the SHPO provided the Forest Service with information on known historic and cultural properties in the Project area.

Subsequently, the Forest Service and the SHPO consulted on the eligibility of identified properties. The results of this consultation are discussed on FEIS p. 9.

The next step is for the Forest Service to request a determination of eligibility from the Secretary of the Interior.

Before any ground-disturbing activities or land exchanges disposing of NFS lands are initiated, the important steps of determining effects on National Register or eligible properties will be completed as well as the preparation of a memorandum of agreement to avoid, satisfactorily mitigate, or accept the adverse effects on the property.

USDA Secretary's Memorandum

No. 9500-2 dated March 10, 1982 (land use policy) - Through compliance with NEPA and CEQ regulations (40 CFR, 1500-1508) the Forest Service allowed public comment, recognized the rights and responsibilities of landholders in making private land use decisions, and recognized the responsibility of governments in influencing how land may be used to meet public needs. The impacts on farm land, forest land, rangeland and wetlands have been evaluated and will be considered in the decision-making process. Finally, should a mine be developed, the Forest Service will assist in planning for the extraction of the molybdenum in such a manner as to facilitate restoration.

Executive Order 11988 (Floodplains) - See FEIS pp. 23-24 for a discussion of this topic.

Executive Order 11990 (Wetlands) this is an Executive Order issued to Federal Agencies to avoid, to the extent possible, the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

In order to consider the impacts of the proposed Mt. Emmons Project and reasonable alternatives to it on Federal wetlands, specific analyses were presented in the DEIS and improved in the FEIS.

The results of these analyses will be considered by the responsible officials in making decisions on the Mt. Emmons Project.

FLOODPLAIN MANAGEMENT

(DEIS p. 256: the following discussion on floodplain management is to be added as a new section at the end of Chapter 4.)

Consideration of floodplain impacts on Federal lands is required by Executive Order 11988.

Findings - Linear features such as worker access roads and the ore haulage system will cross numerous low-order streams, but adverse floodplain impacts will be negligible. A few crossings will involve higher-order streams, but these impacts will also be negligible. Hazards to life and property will be very low.

Rock fills placed across Coal Creek and Carbon Creek will result in 3,300 and 600 feet of stream, respectively, being routed through culverts beneath the fills. Adverse floodplain impacts, and hazards to life and property, will be minimal.

Methodology - Floodplain evaluations were performed using aerial photos. Precise calculations of probable flood volumes were not warranted at this time; they will be performed prior to construction.

Hydrologic Evaluation - Streams in the Project area normally experience their highest floods during the snowmelt season in May and June, but occasional high flows result from summer thunderstorms. Flooding problems notably occur along Coal Creek as it passes through the Town of Crested Butte.

Floodplain Evaluation -

Flood magnitudes and anticipated high-water marks will be identified prior to construction; no problems are anticipated in routing flood flows through culverts.

The Coal Creek and Carbon Creek fills will reduce floodplain storage capacities in their respective drainages by very small percentages. The fill location in Coal Creek is relatively narrow and steep-sided, with only a few feet of floodplain beyond the banks. Flood flows will not be noticeably constricted by routing through a culvert. A minor velocity increase may result, but this can be mitigated by culvert design. Flooding problems in the Town of Crested Butte will not be exacerbated by the presence of the fill.

A similar situation exists at the Carbon Creek fill location.

The Carbon Creek tailing disposal area will cover considerably more floodplain than any other feature. Flood peaks downstream may be increased or decreased, depending on how Carbon Creek flows are bypassed under or around the disposal area. Flood hazards will not be created.

The Alkali Creek tailing disposal area will have a similar impact on Alkali Creek, but to a much lesser degree owing to the creek's relatively smaller flows.

Mapping - Floodplain maps have not been drawn. Maps of affected locations are shown on DEIS pages 12, 13, 18-27, 329, 334, 336, 340, 342, 352, and Map 1.

Alternatives -

Alternative locations are described under Alternatives 2-7. Only under Alternative 1 could Project activities in floodplains be avoided completely. The greatest floodplain impacts will occur under Alternative 5; as noted above, however, these will be minimal. Less impact will result from Alternative 2 and 3, less still from Alternative 4, and least from Alternatives 6 and 7.

WETLANDS

(DEIS p. 256: the following discussion on wetlands is to be added as a new section at the end of Chapter 4.)

The areas of wetlands that would be disturbed by Project alternatives have been identified under the site specific discussions (DEIS pp. 129-200 and 219-236). A comparison of wetland impacts between Alternatives is presented on FEIS p. 3.

Even without mitigation, the effect of the various disturbances is not always total loss of the wetland functions or values discussed in FEIS Chapter 3. This effect depends on the nature of the disturbance. For example, where reservoirs or tailing ponds are proposed, the functions of storm or flood water storage and water purification may actually be enhanced. Similarly, the cultural values of recreation and aesthetics can be enhanced by fresh water reservoirs. Conversely, impacts from mine site construction, transportation construction, and subsidence, approach total loss of the wetland functions and values.

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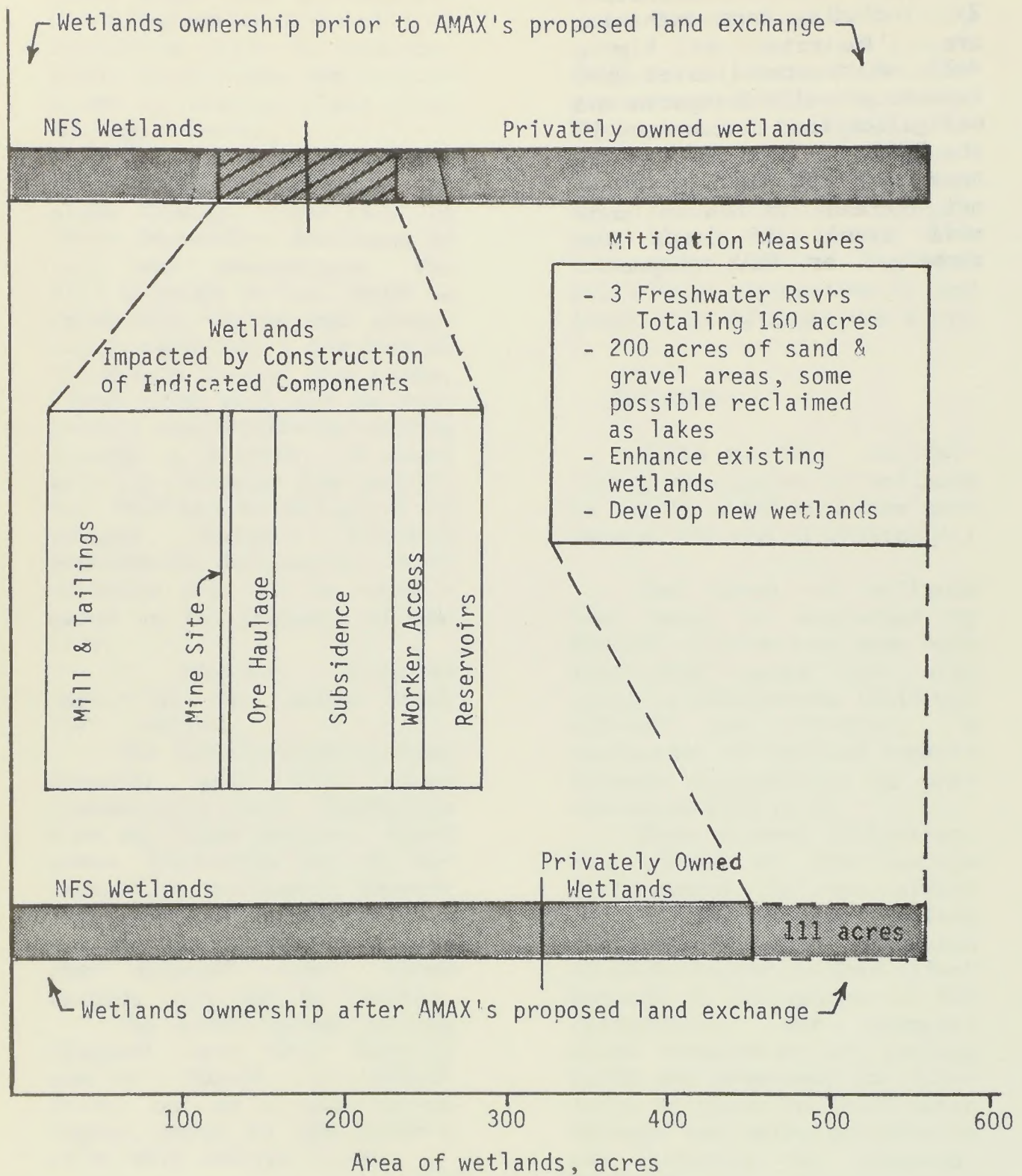


Figure: 4-22 STATUS OF TOTAL, PROJECT INVOLVED, WETLANDS

CHAPTER 5. LIST OF PREPARERS

(not included; same as in DEIS)

CHAPTER 6. PUBLIC INVOLVEMENT

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CHAPTER 6: PUBLIC INVOLVEMENT

This chapter discusses public comment on the DEIS. It includes a brief history of the comment period, and presents comments that were received. Lists of the individuals and organizations receiving copies of the FEIS are in Appendix J.

In light of the exceptionally voluminous comment material received (nearly 500 pages), only the comments of Federal, State, and local agencies have been reproduced. All other comments are summarized. Complete sets of all comment letters are available for public review at Forest Service offices in Delta and Gunnison, Colorado.

Responses were made only to comments on the substance of the DEIS. No attempt was made to address comments stating a position or an opinion, or to address non-substantive comments. This lack of response should not be viewed as a failure to consider a comment. These positions and opinions are valuable to the responsible officials, and will be considered in arriving at their decisions.

Generally, the comments for which responses are included are those which asked specific questions or made statements which required clarification.

HISTORY OF PUBLIC COMMENT ON THE DEIS

The DEIS was released on January 20, 1982 and the public comment period extended from that date to March 20, 1982. A Notice of Availability of the DEIS was published in the Federal Register on January 29, 1982 (p. 4334).

Two public meetings were held: one in Gunnison on March 2, and one in Denver on March 3. A total of 135 people registered at the Gunnison meeting, and a total of 72 registered in Denver.

A total of 123 written comments were received. Of these, 8 were from Federal agencies, 14 were from Colorado state agencies, 4 were from local governments, 17 were from representatives of miscellaneous organizations, and 80 were from individuals. Of the 80 letters received from individuals, 33 were from Gunnison County.

FEDERAL AGENCY COMMENTS

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FOREST SERVICE RESPONSES

LETTER 1



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII

1860 LINCOLN STREET

DENVER, COLORADO 80295-0699

MAR 18 1982

Ref: BPM-EA

Mr. Jimmy R. Wilkins
U.S. Forest Service
1063 Main Street
Delta, Colorado 81416

Dear Mr. Wilkins:

The Region VIII Office of the Environmental Protection Agency has reviewed the Draft Environmental Impact Statement (EIS) for the Mount Emmons Mining Project. Generally, we have found the document to be comprehensive and well-researched. The interdisciplinary team is to be commended for the work they did in preparing the document.

EPA has of course been a cooperating agency on this project. Through the EIS scoping activities and the Colorado Joint Review Process we have evaluated the environmental issues of concern to EPA. Our reviews indicated that the noise and air quality analyses are adequate and that the impacts will be adequately handled with the proposed mitigation.

During the scoping process, we discussed with you the issues of surface and groundwater quality and wetlands mitigation. The EIS contains data regarding mine subsidence and geological factors that we were not aware of during scoping. Our principal issues of concern are as follows:

1. Wetlands Impact Identification and Mitigation: The public notice (No. 7775) by the Corps of Engineers for issuance of the Section 404 permit indicates that the proposed project will result in the destruction of 111 acres of natural wetland and 104 acres of irrigated haymeadow/pasture. A further clarification of the total acreage and types of wetlands impacted by this project is necessary. This should include the location and acreage of irrigated haymeadows that are natural wetlands and the acreage and types of alpine or subalpine wetlands that may be affected by subsidence on Mt. Emmons.

The EIS does not discuss alternative mitigation measures identified by EPA and other agencies in our past discussions on loss of wetlands. EPA recommends the replacement of lost wetland functions by creation, restoration or enhancement of wetland areas rather than by purchase and change of ownership of existing wetlands as proposed in the EIS. We will need to discuss the wetland mitigation issue with you and the Corps of Engineers pursuant to Section 404 of the Clean Water Act.

2. Water Quality and Ground Water Problems from Mine Subsidence: The projected subsidence of Mt. Emmons may create significantly larger volumes of acid mine drainage than exist at present and that pose a long-term threat to the area following mine closure. The Appendices to the EIS identify possible measures to mitigate this problem using existing technology but a specific solution is deferred to the future. The final EIS should contain an estimate

1-1

The wetlands of the project area have been mapped. This map can be found in AMAX (1981a,b), and CDM (1981b). A consolidated comparison of wetland impacts for all alternatives is on FEIS p. 3. This comparison includes 29 acres of subalpine willows that may be impacted by subsidence of Mt. Emmons under alternatives 2-5 and 7. Irrigated haymeadows were not included in the wetland impact analyses in the Mt. Emmons DEIS. The Corps of Engineers will determine if portions of irrigated haymeadows or other areas fall under Section 404 jurisdiction. That determination will be made as a part of Section 404 application processing.

Alternative mitigation measures for creation or enhancement of wetland areas are discussed on DEIS pp. 281, 284, 300, 303, and 305. These measures are consolidated in FEIS Appendix B.

1-2

This information is presented in Snow (1981). Forest Service bonding authority under 36 CFR 228.13 is restricted to surface activities.

LETTER 1 (continued)

FOREST SERVICE RESPONSES

-2-


of mine drainage flows and impacts as mining operations progress. We recommend that you consider requiring AMAX to furnish a bond to fund anticipated acid mine drainage control costs following closure of the mine. Your regulations (36 CFR 228.13) authorize such a bond requirement.

These issues and some additional concerns are discussed in the attached detailed comments.

With appropriate mitigation of lost wetlands and the long-term acid mine drainage problem, the proposed alternative 3 will be satisfactory to EPA. We believe that if proper mitigation cannot be assured with the present proposal, Alternative 6 (small mine) has some environmental advantages and may prove economically practicable at some point in the future when molybdenum market conditions improve.

Based on these comments, we have rated this Draft EIS as ER-2. This means that we have environmental reservations regarding the impact of this project; the principal issues we have identified above need to be further discussed and highlighted in the final EIS, perhaps with some additional information from the reference reports. Mike Gansecki (FTS 327-4831) and others on the EPA Regional staff will be available to work with you to resolve these issues.

Sincerely yours,


Steven J. Durham
Regional Administrator

Enclosure

LETTER 1 (continued)

FOREST SERVICE RESPONSES

DETAILED COMMENTS OF EPA REGION VIII ON THE MT. EMMONS DRAFT ENVIRONMENTAL IMPACT STATEMENT

1. Wetlands Impact Identification and Mitigation Measures

The discussion of overall wetland impacts resulting from the Mt. Emmons Project is somewhat unclear in the draft EIS. The EIS on page 28 presents a discussion on vegetation impacts from the seven alternatives considered but does not indicate the total affected wetland acreage. Forty-three acres of natural vegetation and 99 acres of irrigated haymeadow are identified as being lost with the Alkali Creek tailings site alternative. On page 284 of the EIS Appendix A., it is mentioned that the project will consume 111 acres. The Corps of Engineers Public Notice for the Section 404 Permit application identifies 111 acres of natural wetlands and 104 acres of irrigated haymeadow as being disturbed by the proposed alternative.

The EIS should clearly identify the overall wetland impacts from the various alternatives and present them in similar fashion to the overall Acres Disturbed chart shown for affected Forest Service lands on page 28. This should be done for the impacts for various components of the project (railroad, mine, mill site reservoirs, etc.) The EIS did not identify whether there are any wetland areas on Mt. Emmons that will be affected by the eventual subsidence and rubblization of as much as 910 acres. A rough estimate of possible wetlands from the vegetation listing on page 101 could be as high as 218 acres lost. The EIS should also identify whether there will be any wetland losses in road construction.

Mitigation of these wetland losses is a very important issue to EPA. The proposed mitigation is to turn over 331 acres of various wetland types to the Forest Service as part of the land exchange. The 7,587 acres of land that AMAX proposes to acquire contain wetlands, some of which will be destroyed, some of which will be managed, and others appear to be of indeterminate status. Has any estimate been made of the amounts and types of wetland acreages in total that will be turned over to AMAX? It is not clear that there is even a net gain of wetland acres in public domain with the proposed land exchange.

We are also concerned with the eventual status of those wetland areas that might be transferred to public domain. Would they enjoy perpetual protection or might mining claims be filed on these lands in the future? Will these wetlands be specifically protected in the Forest Service's land management plans as wetlands or be available for multiple-use? The EIS should identify the extent to which protection can be afforded these lands. The EIS should also better identify the extent of wetland values of these lands.

The EPA recommendation for mitigation of wetland losses is for replacement of lost wetland functions by creation, restoration, or enhancement of wetland areas. Beneficial wetland functions are performed by wetlands which are held in private ownership as well as those held in public domain. A

1-3

Many of these comments are answered in Response 1-1. Information regarding the net change in public domain wetland acres is on FEIS p. 24. This information shows a net increase of approximately 150 acres in NFS wetlands. These acquired wetlands will be managed in accordance with all laws, regulations and executive orders relating to wetland management.

The values of wetlands are addressed in CDM (1981a), and are included on FEIS p. 5.

LETTER 1 (continued)

FOREST SERVICE RESPONSES

-2-

change in the ownership of wetland areas does not contribute to replacement of lost wetland functions which result from filling activities; hence, there is a net loss of beneficial wetland functions. The mitigation posture stated above has been adopted to prevent the loss of wetland benefits to the public.

We strongly urge that the final EIS contain alternative proposals by AMAX for enhancement, creation, or restoration to replace the natural wetland acres altered or destroyed by this project. Further work will need to be done in fully identifying these natural wetland values. EPA will recommend that the U.S. Army Corps of Engineers not issue the 404 permit until additional information is submitted by AMAX to provide for better mitigation. We would like to meet with Forest Service and Corps of Engineers officials to discuss these positions.

2. Mine Subsidence and Groundwater

The EIS indicates on page 101 that as many as 910 surface acres of Mt. Emmons could be affected by subsidence from the mined-out cavity. The subsidence over time will create a rubblized column that could provide almost total surface drainage into the mineralized mined-out area. On page 56 of the EIS, the present problems associated with the Keystone mine drainage are discussed. There already appears to be a significant amount of ground water leaching through fractures in the Mesaverde Formation into the mine. Historically, the Keystone mine averaged some 175 gpm of discharge during the July-September season. Acid mine drainage with its concomitant release of heavy metals has been a serious problem for Coal Creek, and has only recently been mitigated with the construction of the treatment plant. The EIS also mentions that as much as 400 gpm has been experienced during the Spring runoff season with the construction of AMAX exploratory tunnels. The EIS points out that much of the Mt. Emmons runoff bypasses the mine by remaining confined in the shallow aquifer and reaches the main drainages through surface runoff or springs.

With the subsidence of the surface, the potential appears for an enormous increase in groundwater to be experienced in the mine discharge. A rough calculation we made suggests that a 90-day Spring discharge from the mine could total some 1500-2000 gpm if the runoff from the Mt. Emmons surface disturbance is routed through the mine. It is very important to evaluate what this may mean in terms of future acid mine drainage. This water will almost certainly pervade most of the mined out mineralized area. With rubblization, a greater amount of void space could expose fresh areas of sulfide mineralization to create a very expensive acid and minerals removal treatment problem, if in fact it can all be controlled. A serious concern is that the presence of numerous old and new tunnels and natural fractures will make it impossible to collect all of the metal laden water in a manner that would allow it to be treated before discharge.

1-4

This information is presented in Snow (1981), which is available through the microfiche reference system discussed on DEIS pp. 6-7. In addition, see FEIS p. 7.

LETTER 1 (continued)

FOREST SERVICE RESPONSES

-3-

The EIS suggests possibilities for treatment on page xviii, paragraph 3 with the statement: "Post-mining controls measures that could be taken (for acid seepage) have been discussed by AMAX. The technology of acid drainage control and prevention is improving steadily, and new methods may become applicable in the future." EPA is not nearly so confident that these kinds of controls can be developed (or are within an economically acceptable cost limit).

Appendix A to the EIS contains a discussion of possible control measures such as discharge treatment, grouting and sealing of faults, slurry discharge into the rubble zone, and a decant drainage system. Given the particular configuration and geology of the Mt. Emmons deposit, is there any previous treatment experience of a similar nature to gauge the relative success of these measures? Piezometric heads at the base of the mine could lie in the 1000 to 2000' range. Can grouting and slurry deposition significantly reduce the amount of water to be treated in the long run?

The most important issue here, presuming that control of some of the groundwater intrusion is possible, is cost and liability. How much will treatment costs be, and who will be required to maintain the treatment plant almost indefinitely? The Final EIS should present some estimates of long-term costs for maintaining a discharge to Coal and Oh-Be-Joyful Creeks that will allow for desired stream uses. It is recognized that a historical acid mine drainage problem existed before AMAX acquired the Henderson property. However, current mining activities will increase the potential for amounts of acid and metals pollution. What is the eventual prognosis for area stream quality (Coal Creek, Oh-Be-Joyful Creeks, and the Slate River) with the cessation of the mine? The Forest Service should consider requiring a bond to provide post-mining treatment in accordance with Forest Service regulations (36 CFR 228.13).

The heart of the National Environmental Policy Act evaluations is to try to identify and anticipate long-term and unprecedented impacts before they occur. We believe that the Mt. Emmons EIS will be seriously inadequate until the mine subsidence and groundwater issues are fully evaluated. EPA has some technical resources in its laboratory staffs that may be able to assist in this predictive analysis. The NPDES permit for the mine discharge may also have to be rewritten to reflect this long-term discharge problem.

3. Water Quality Impacts from Carbon, Elk and Coal Creek Fill Materials and Tunnel Construction

Neither the Draft EIS nor the AMAX Environmental Report identifies the kind of sedimentary formations encountered in the tunnel alignment between Carbon Creek and Coal Creek. AMAX plans to use the spoil materials from the tunnel as fill for the Carbon Creek crossing and reservoir (580,000 cubic yards), the Coal Creek crossing (400,000 cubic yards) and the Elk Creek reservoir (585,000 cubic yards). The question arises as to what the impacts

4

5

1-5

This has been added. See FEIS pp. 12-13.

on Carbon Creek might be if significant amounts of leached salts or sediment from the highly saline and erodible Mancos Shale formation occur in the spoils materials. As best we can determine at present, the Coal Creek fill material will contain some mineralized sulfide spoil materials. Although an exact geological strata map is not available in the EIS for the mine entrance and railroad tunnel alignment, it appears that both tunnels could traverse extensive sections of Mancos Shale formation. It also appears that the sandstone Mesaverde Formation will be located closely above both tunnels.

It is possible that exposure of Mancos shale and mineralized material to air, coupled with leaching from both precipitation and fluctuations of stream and reservoir levels, as well as surface erosion, could result in saline and toxic materials entering the aquatic ecosystem below these points. If these contaminants are present in the fill materials, the EIS must reassess the impacts on biota below these points. EPA is willing to assist in identifying water quality impacts from these sources.

An additional concern arises from the proximity of the Mesaverde Formation lying above the tunnel alignment. It is a sandstone formation that can contain sizeable flows, especially where fractures occur. Will this pose a water quality control problem particularly in the railroad tunnel? If water is experienced, how will it be controlled? Will treatment at the discharge point be necessary?

We believe that the EIS must properly identify the formations to be traversed and any corrective solutions necessary to protect water quality identified in the mitigation measures section. This could include a plan to properly bury toxic or saline spoil materials in the filling of the crossings.

In discussions with the Interdisciplinary Team, we understand that the Geotechnical Reports on microfiche present specific data on the formations encountered along the alignment of the tunnel bore. We will discuss this issue further with you after we have had a chance to review the information.

4. Impacts on the Roaring Judy Fish Hatchery

There is concern regarding a possible discharge of a slug of toxic materials from the Keystone treatment plant and eventual AMAX mine discharge, were there to be a breakdown in treatment plant function. Hatchery fish could be destroyed if such a toxic slug were to be routed through the hatchery. As a possible mitigation measure, a warning system could be set up to alert the hatchery (and any other sensitive downstream users) if a plant breakdown or toxic slug were occurring. The likelihood of such an incident should be considered in the EIS.

5

6

1-6

This mitigation measure has been added. See FEIS Appendix B.

LETTER 1 (continued)

FOREST SERVICE RESPONSES

-5-

5. Impacts on the Crested Butte Water Supply

EPA agrees that strong consideration should be given to alternatives such as moving the intake upstream in order to protect Crested Butte's water supply. The final EIS should indicate the preferred measure especially if found acceptable to the Town of Crested Butte.

6. Alternatives to the Project

In view of the severe water quality and ground water problems that may be experienced with the proposed project alternative, it may not be possible to adequately correct these with add-on mitigation measures. Another possibility for alleviating these problems is to consider another alternative, particularly Alternative 6. This is the "small-mine" option to remove 10,000 or so tons per day, using a conveyor facility to the closer Carbon Creek tailings site.

We believe that this option should be considered environmentally desirable for a number of reasons: This approach would utilize a room-and-pillar technique, instead of panel caving. This would prevent the serious subsidence problem and its possible long-term water quality and aesthetic impacts to the area. Constructing a surface conveyor facility would also obviate the need for a tunnel through Mt. Axtell. The area of impact would be smaller and more closely confined to the mine site. Finally, the wetlands and wildlife impacts at Alkali Creek could be avoided. It should also be recognized that this alternative may also require deferring the construction and operation of the mine to some point in the future, when this ore deposit is sufficiently attractive from a financial standpoint.

7. Mitigation Measures

The discussion of how mitigation measures will be chosen and implemented is unclear in this EIS. The EIS presents two Appendices (one from AMAX and one from the Forest Service) listing certain mitigation measures. Since this is an EIS with cooperating agencies involved, the document should contain all relevant mitigation measures within the purview or legislative control of the agencies involved.

In the case of the Section 404 Permit, EPA, Corps and other agency personnel have recommended mitigation measures in discussions with the Forest Service that were not listed. We recommend that this section be restructured to reflect the greater variety of mitigation options that may be available.

1-7

The environmentally preferable alternative will be identified in the Forest Service Record of Decision.

7

1-8

To the extent the Forest Service is aware, the mitigation discussions in the DEIS and those added in the FEIS reflect a full range of mitigation options that may be available. While the DEIS includes identification of mitigation measures that the Forest Service can require, the Record of Decision will identify the mitigation measures that will be required.

8

LETTER 2



DEPARTMENT OF THE ARMY
SACRAMENTO DISTRICT, CORPS OF ENGINEERS
650 CAPITOL MALL
SACRAMENTO, CALIFORNIA 95814

REPLY TO
ATTENTION OF

SPKCO-Q

23 March 1982

Mr. Jimmy R. Wilkins, Forest Supervisor
U.S. Forest Service
1063 Main Street
Delta, CO 81416

Dear Mr. Wilkins:

As a cooperating agency the Sacramento District has reviewed the Mount Emmons project draft Environment Impact Statement following our responsibilities under Section 404 of the Clean Water Act.

We offer the following comments and recommendations on the document. These comments relate to our decision on the project proposal by Amax for a Department of Army permit, and they are directed to the draft EIS as an information document. In general, the draft EIS does not give enough specific information on Water Resource Impacts to be adequate for our Section 404 permit review. Providing the information that is suggested in the following specific comments would make the document sufficient for our needs.

Summary:

Page XIX, second column, line 3. The number 43 should be 86 according to the Amax application for Section 404 permit.

Alternatives Including the Preferred Alternative:

How does the denial of the Colorado-Ute 345 kV line affect the discussion of alternatives?

Page 39, second column, second paragraph. If there are advantages to the environment and water quality from using the East River corridor instead of the Ohio Creek corridor they should be discussed.

The environmentally preferred alternative and the least environmentally damaging of the construction alternatives should be identified.

FOREST SERVICE RESPONSES

2-1

This figure was apparently obtained using Figure A-14 in the Section 404 permit application. For consistency in comparing alternative impacts, the DEIS used vegetation maps from Stoeker and Kemmerer (1980) and methodologies described in FEIS Chapter 3 wetlands discussions. The statement in the DEIS has been revised, however; see FEIS p. xxiv.

2-2

See FEIS Appendix D.

2-3

No distinct advantages to the environment and water quality were identified. This corridor was not analyzed in detail because, for one thing, it would be particularly troublesome to locate the railroad in the narrow part of the canyon near Almont.

2-4

These will be identified in the Forest Service Record of Decision.

LETTER 2 (continued)

FOREST SERVICE RESPONSES

SPECO-O

Mr. Jimmy R. Wilkins

23 March 1982

Environmental Consequences:

The risk to Roaring Judy's Fish Hatchery needs to be better described. The EIS should explain why the risk to the hatchery is considered low. The potential for a "worst case" incident of water contamination at the hatchery should be discussed with a description of its effects. Potential alternative water supplies for hatchery should be described.

Leachate from fills during and after project construction should be addressed under every topic applicable in the environmental consequences section.

Page 104, first column. The amount of wetlands lost should be quantified. Also, wetland values that will be lost should be discussed. An attempt should be made to forecast secondary impacts.

Page 106, first column under Aquatic Ecology. This section should describe in detail the alteration of the aquatic systems resulting from project construction and operation. Secondary impacts of wetland loss on stream systems should be discussed.

Page 108, Impacts on Water. Basis for the statement that "sediment . . . will be flushed downstream without significantly damaging channel morphology or fishery's habitat" should be discussed. Include reasons for the statement that "potential stream pollution from toxic spills . . . will be quite low." Have spill risk, probability studies been conducted? If they have, their results should be summarized. The potential chemical contaminants should be listed and their possible effects on water quality should be discussed.

In the section on water or acid drainage the effect of mine subsidence on drainage patterns should be covered. Will water either form a lake or drain through the mine causing contaminated surface or groundwater?

Page 131, Aquatic Ecology. Again, the chemicals and their potential effects should be described. We do not think it is likely that chemical effects would be similar to sediment effects.

Page 138, Aquatic Ecology and Water Section. The EIS should recognize spills and accumulation of ore along access roads as a source of damage to water quality and aquatic life.

Page 149, Alkali Creek Mill Site Impacts Under Topic Wetlands. Amax's report identifies 86 acres of wetlands instead of 43.

Pages 153, 154 and 170, Water Sections. The probability of the fish hatchery being damaged to some extent over the project life either by spills from the tailings or the access road should be discussed. Dangers of chemical spills and ore accumulation contaminating runoff from the access road in Alkali Creek should be stated on page 170.

Page 163, Aquatic Ecology Section. Address Molybdenum ore spillage from the train in all sections of the "ore haulage route" discussion.

2-5

The reasons for considering the risk low are discussed on DEIS page 154. To expand on this material: (1) the tailing dam will be designed to prevent leakage; (2) the Mancos shale is unlikely to route groundwater in an easterly direction; (3) the mill water reservoir, located below the tailing dam, will intercept and hold near-surface seepage that might occur, thus acting as a first line of defense; (4) a groundwater monitoring network below the mill water reservoir will detect any contamination that eludes control and threatens the spring used by the fish hatchery; and (5) movement of contaminated groundwater, if any, should be slow enough to permit installing interceptor wells or locating a substitute water source before damage occurs.

Worst-case impacts for Roaring Judy Fish Hatchery are discussed on FEIS p. 12.

2-6

This has been added. See FEIS p. 12-13.

2-7

The DEIS p. 104 discussion is under the topic of General Impacts, which does not include detailed information on wetland impacts. Such information can be found on DEIS pp. 130, 138, 142, 147, 149, 161, 170, 174, 179, 186, 191, 197 and 200. A discussion of wetland values lost is on FEIS p. 24.

Secondary impacts on wetlands cannot be predicted with confidence. Historical tendencies for development to occur on wetlands are acknowledged on DEIS p. 104. Under improbable worst-case conditions, approximately 1200 acres of wetlands would be developed. The Corps' implementation of the Section 404 program, however, is expected to result in a vastly smaller number of acres being affected in this manner.

2-8

Detailed discussions of aquatic system alterations were discussed in the DEIS in sections which described the impacts of specific project components. For additional discussion of wetland impacts, see FEIS p. 24.

2-9

This statement applies to linear features such as roads and railroads. Given the existing climate, terrain, and geology, and the relatively small size of such features, significant sediment loadings are not expected.

2-10

The reasoning behind this statement is presented in the sentence following the one quoted: "Storage areas will be surrounded by berms, and runoff from the (mine and mill) sites will be controlled and treated." (DEIS p. 108)

LETTER 2 (continued)

FOREST SERVICE RESPONSES

SPKC9-0 23 March 1982

Mr. Jimmy R. Wilkins

Page 175, Water, third line. Delete the word probably.

Page 252, Possible Mitigation Section. The EIS should distinguish clearly mitigation that is actually proposed from mitigation measures that are potential. The reasons for not utilizing any possible mitigation measure should be explained.

Page 253, Water Section. If we are committing Coal Creek, Carbon Creek, East River, Alkali Creek, Elk Creek and Slate River to water quality damages in the short term with potential for long term damage and loss of productivity, it should be stated in this section.

Page 255, Water Resources Section. The aquatic resources that will be irretrievably committed to lower diversities and poorer water quality, and the wetlands that will be irretrievably lost should be listed in this section.

Thank you for the opportunity to review the Mount Emmons draft EIS. If you have any questions on these comments please call Tom One in our Sacramento office (916) 440-2541, or Rodney Woods in our Grand Junction office (303) 243-1199.

Sincerely,

Michael L. Helm
DON DENNIS
Chief, Construction-Operation Division

2-11

Risk spill probability studies have not been conducted.

2-12

Chemicals planned for use at the mill are listed on DEIS p. 328. The impacts of a spill that occurs during transit are discussed on FEIS p. 7.

2-13

This information is presented in Snow (1981). The formation of a lake is not expected.

2-14

The chemicals used at the mine site are indicated in DEIS Table C-2. They are petroleum distillates consisting of primarily oil, grease and fuels. See Response 2-9.

2-15

The paragraph on aquatic ecology references the reader to DEIS p. 131, which discusses spills. Ore will not be hauled along worker access roads to the mine site.

2-16

See Response 2-1 and FEIS p. xxiv.

2-17

Probability of Fish Hatchery damage is discussed on DEIS pp. 108 and 154. Ore will not be hauled along the Alkali Creek access road. Runoff from the road is covered by the discussion on DEIS p. 108.

2-18

Ore spillage was addressed on DEIS p. 103 under Molybdenosis. This coverage has been clarified FEIS p. 7.

2-19

This has been done. See FEIS p. xxiv.

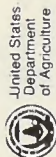
2-20

The Forest Service Record of Decision will list the mitigations that will be required for activities on NFS lands. Until that document is issued, the mitigations that have been identified can only be considered as "possible".

2-21

This discussion has been revised. See FEIS pp. 18-19 and 24.

LETTER 3



United States
Department
of Agriculture

Rural
Electrification
Administration

Washington
D.C.
20250

MAR 4 1966

SUBJECT: Colorado 18 Gunnison
Mount Emmons Project

TO: Mr. Jimmy R. Wilkins
Forest Supervisor
U.S. Forest Service
1063 Main Street
Delta, Colorado 81416

As a cooperating agency in the Mount Emmons Mining Project, we have reviewed the Draft Environmental Impact Statement. Generally, we found the document is satisfactory and it adequately covers the project alternatives, proposed action and associated environmental impacts in accordance with Council on Environmental Quality regulations regarding implementation of procedural provisions of the National Environmental Policy Act of 1969.

However, we have enclosed some subject matters which should be addressed or clarified.

Thank you for the opportunity to comment upon this document.

Frank W. Bennett

FRANK W. BENNETT
Director
Power Supply Division

Enclosure

LETTER 3 (continued)

FOREST SERVICE RESPONSES

MOUNT EMMONS PROJECT DEIS REA COMMENTS

General Comments

1. The DEIS did not discuss the impact of the project on floodplains. Please include a discussion for complying with Executive Order 11988 on floodplain management. 3-1
2. REA suggests that a section entitled, "Regulatory Compliance with Select Laws and Executive Orders" be added to the summary of the EIS. This Section should include methods of compliance with the following:
 1. E.O. 11988 on floodplain management.
 2. E.O. 11990 on protection of wetlands.
 3. E.O. 11593 on protection and enhancement of the cultural environment.
 4. Endangered Species Act of 1973.
 5. Federal Clean Air Act.
 6. National Historic Preservation Act of 1966.
 7. Fish and Wildlife Coordination Act.
 8. U.S. Secretary of Agriculture's Memorandum No. 1827, revised - Statement on Land Use Policy - for important farmland.3-2

This has been added. See FEIS p. 23.

This has been added. See FEIS pp. 21-23.

Specific Comments

1. Page xix - This refers to the potential contamination of the Roaring Judy Fish Hatchery by sediment created during project construction. The impact of sediment on water quality may be severe especially during snowmelt or rainstorms. The DEIS did not discuss adequate mitigation measures necessary to minimize the quantity of sediments entering the fish hatchery so as to decrease the turbidity of water to acceptable levels during construction. 3-3
2. Page 33 - It is stated that "Acres of soil disturbance are shown in the figure under wildlife" The wildlife section does not contain such discussion based on the quantity of soil disturbance; instead the wildlife discussion is based on the indices of wildlife impact. 3-4
3. Page 34 - The alternatives with the greatest amount of access roads in descending order should be: 4, 3, 2, 5, 6 and 7; not 4, 3, 2, 7, 5 and 6. 3-5

The discussion on DEIS page xix is part of the Summary. Greater detail on Roaring Judy Fish Hatchery impacts is on DEIS pp. 153-154 and FEIS p. 12. Mitigation measures for sediment control are contained in Table B-5 (DEIS pp. 310-312).

This has been corrected. See FEIS p. xxiii.

The ranking described on DEIS p. 34 used the construction access indices determined by CDM (1981c), weighted these by segment midline length, and divided the sum by the total alternative length. When this weighted averaging method is used to compute a total construction access index for alternatives, the ranking discussed on DEIS p. 34 is obtained.

LETTER 3 (continued)

FOREST SERVICE RESPONSES

3-6

According to the Forest Service biological assessment (Forest Service, 1981d), which was cited on DEIS page 50 and is included in the microfiche reference system, there is no habitat in the project area for either the American Peregrine Falcon or the Black-footed Ferret. The DEIS noted this fact on p. 106. See also FEIS pp. 21-22.

3-7

The Project area contains no streams with these designations.

3-8

Forest Service review of the Project is the basis for this statement.

3-9

The direct affects on agricultural lands addressed in the General Impacts discussion (DEIS p. 128) are specifically identified on DEIS p. 160 as approximately 100 acres of private hay meadow and an additional 820 acres of rangeland. On page 33, the DEIS states that no prime agricultural land will be affected by the Project.

3-10

Annual water consumption will be about 3,000 acre-feet, as stated on DEIS pp. 153, 176 and 188. Water rights are discussed on DEIS p. 110. The impact of this water use on agriculture is discussed on DEIS p. 128 and FEIS p. 8.

3-11

Specific discussion relating to the Bald Eagle is on DEIS pp. 152, 308. Scoping did not identify raptorial birds as a special issue. Impacts on them are integrated into the wildlife impact indices.

3-12

We do not believe that an environmental and economic comparison of the various structures would be appropriate or usable for the draft or final EIS. The EIS, especially in the power section, deals with corridors at a broader level than styles of individual structure sites. If individual structure designs were to be compared at the DEIS (corridor) level, then it would be necessary to compare other items as well, such as: type of material (i.e. wood, steel, aluminum), footing, types of conductors, road costs, types of landscaping, and many other details that are involved in the final design of a transmission line. The key, of course, is a comparison of the various alternatives at a broad scale to arrive at a decision for corridor selection.

3-13

Steel lattice towers have not been selected for the proposed transmission lines structures. The type of structure will be selected during the design stage and will be done in cooperation with the Forest Service and the utility company. The selection of tower structures will be based on a number of factors. Some of these factors are:

- terrain considerations
- a. type of background
- b. steepness
- c. shape

6. Page 52 - Reference should also be made to the presence of other threatened and endangered species such as the American peregrine falcon and black-footed ferret which, in addition to bald eagle and whooping crane, also inhabit the project area. The impacts to these species should be discussed in detail.

7. Page 56 - The Gunnison River is a major stream in the project area. Is any part of the Gunnison River in the project area designated as wild, scenic or recreational river? If so, the limitations of such designation should be identified and the methods for compliance should be discussed.

8. Page 125 - The statement is made that none of the alternatives will have any impact on civil rights. The basis for this statement should be discussed.

9. Page 128 - Identify and locate the acreage of cropland and rangeland including prime farmland and prime rangeland that will be removed from agriculture due to this project. The effects of the loss of such agricultural productivity should be discussed.

10. Page 128 - Shifting the use of water from agriculture to mining will take place if the project is implemented. The effects of this change in water use upon irrigated agriculture and other water uses should be discussed in detail. What are the consumptive water requirements for this project?

11. Page 193 - Wintering bald eagles are found in the Roaring Judy Fish Hatchery area. Identify the possible environmental impacts and mitigative measures that will be taken to avoid impact due to this project on raptorial birds including bald eagles?

12. Page 223 - An environmental and economic comparison of the various transmission line structures should be presented, preferably in tabular form.

13. Page 223 - Environmentally, many persons judge wood pole H-frame structures to have less visual impact than steel lattice towers. The reasons for the structure selection should be discussed.

14. Page 223 - Alternative voltage levels to the 115 kV transmission line such as 138 kV should be discussed. Please include the rationale for selecting 115 kV level.

FOREST SERVICE RESPONSES

- vegetation cover (type & density)
 - a. grass-forb
 - b. shrub
 - c. tree cover and combination tree
- difficulty of construction
 - a. types of access
 - b. altitude
- voltage level
- soil conditions

Our experience has shown that steel lattice towers tend to meet most of the factors listed above. The galvanized steel members of the tower can be dulled chemically to blend in a forest environment. In most tree covered areas, the trunks of the trees appear to be black, and the lattice steel members of the tower can be dulled to that color. It is difficult to darken wood pole structures and have them retain the dark color over a period of time.

The total mass of a typical free-standing lattice tower is greater than a wood pole structure; however, because of the individual small members within the lattice tower, as compared to the large individual wood pole, the lattice tower presents less mass. The lattice tower because of the individual small members, when the tower is placed with backgrounds (mountains, trees, cliffs, etc), the lattice tower picks up that background. The wood pole structure, because of its single large mass, does not pick up the background.

The wood pole structure is limited in carrying higher voltages, because it cannot support the larger conductor. Many of the wood pole structures, especially at the P.T.'s and three pole, have to be guyed, which increases the visual impact.

Lattice towers have a variety of design shapes, (i.e. delta, H, Y, etc.) whereas wood pole structures are limited basically to single, H or three pole design.

3-14

We used a poor choice of words in the DEIS. On page 223 it states "... but additional capacity will eventually be needed to meet the demands of increasing population." The intent was to say that there will not be enough power in the area to meet the demand. The proposed 115 kV line is sufficient to handle the power if it is available.

Higher voltage lines, i.e. 230 kV, etc., were explored. Those sizes were not needed to carry the power requirements. What is lacking is the actual electricity to meet the demand for the future.

The wording has been corrected. See FEIS p. xxiv.

3-15

Confusion developed here because the sentence which read "... but additional capacity will eventually be needed ..." (DEIS, p. 223) should have read "... but additional power will eventually be needed ..." The possible solutions for this are discussed on DEIS p. 221. Double circuiting was considered but not analyzed in detail for the reasons explained on FEIS, p. 4.

3-16

These measures were discussed on DEIS p. 226 and have been incorporated into FEIS Appendix B.

13. Page 223 - Tests made on oxidant concentrations due to 765 kV lines concluded that no ozone concentration attributable to the transmission lines was detected during the tests (Frydman, et al, 1973, IEEE Transmission Paper on Power Apparatus and Systems, p. 1161). Therefore, it is reasonable to conclude that ozone concentration will not be a problem at the 115 or 230 kV levels.

14. Page 223 - There is no discussion of constructing a double circuit 115 kV line as an alternative to provide for future power needs. The use of alternative number 2 with double circuit towers with the second conductor being installed at a later date, would solve both immediate and long-term needs. The rationale for the project selection should be discussed.

15. Page 281 - Describe the specific mitigation measures, if any, that may be taken to reduce the incidence of collision of birds with the power transmission lines near wetland or riparian areas.

16. Page 309 - State specific soil erosion control techniques that will be employed to minimize the potential for sedimentation to the Roaring Judy Fish Hatchery.

17. Pages 345 & 346 - The status of Colorado-Ute's proposed Rifle to San Juan 345 kV line that would pass near Paonia is uncertain at this time. The discussion of this power source should include the possibility of not building the 345 kV line or the use of the Grand Junction corridor and upgrading Western's 230 kV Rifle-Curicanti line at a later date. The new 345/115 kV North Fork Substation may not be built by Colorado-Ute; therefore, an alternate substation source should be identified.

LETTER 4



United States Department of the Interior

OFFICE OF THE SECRETARY
WASHINGTON, D.C. 20240

MAR 25 1982

44-027165

Jimmy R. Wilkins, Forest Supervisor
U.S. Forest Service
1063 Main Street
Delta, Colorado 81416

Dear Mr. Wilkins:

We have reviewed the draft environmental statement for the Mount Emmons Mining Project, in Gunnison County, Colorado. There are several topics which we would like additional attention given in the statement. These include water rights, recreation resources, cultural resources, tailings disposal and wildlife impacts and mitigation. Wildlife impacts, in spite of close involvement by our staff at the field level over several years, appears to be a major issue at this time.

Water Rights

Junior water rights (discussed on p. 110) may be of little value because the United States (Uncompahgre Project) holds a 1901 Decree for 1300 ft³/s out of the Upper Gunnison Basin. Senior rights might be of more value, dependent on their date. These, however, would be irrigation rights and would be subject to Colorado's allocation of consumptive use. It also should be pointed out that the United States has a decree for Blue Mesa Reservoir that would be interfered with if the project used winter or spring flows in the Gunnison River drainage. A contract for exchange water from Blue Mesa could be required.

Impacts of changing the use of senior water rights should be addressed. If Blue Mesa Reservoir water is needed by exchange, impacts on the reservoir should be addressed. Total depletions resulting from the project should also be addressed.

Recreation Resources

The projected increase in population growth of the city of Gunnison can be expected to result in increased fishing pressure and outdoor recreational demand on Curecanti National Recreation Area. The effect on recreation quality should be analyzed.

A spill or breakage of the tailings pond could result in adverse effects to a variety of benthic organisms because of potentially high concentrations of heavy metals and acid. Present research (Colburn, Theo. 1981. Manuscript thesis, Western State College) seems to indicate certain aquatic insects, such as the stonefly, *Pteronarcys californicus*, cannot molt when exposed to heavy amounts of cadmium and possibly molybdenum. Degradation of bottom dwelling organisms would affect the quality of the sport fisheries in Curecanti National Recreation Area.

FOREST SERVICE RESPONSES

3-17

Site specific mitigations will not be developed until the pre-construction stage. General mitigations of this nature are discussed on DEIS pp. 310-312.

3-18

See FEIS Appendix D. Since REA is preparing the EIS for the Colorado-Ute proposal, it is assumed that Colorado-Ute's new proposal will be addressed in REA's environmental documents.

4-1

See Response 3-10. The use of Blue Mesa water is not being contemplated at this time.

4-2

This information is presented on DEIS pp. 116-121.

LETTER 4 (continued)

Jimmy R. Wilkins, Forest Supervisor

2

Wildlife

The Fish and Wildlife Service (FWS) has been involved in studies of the probable effects of the Mount Emmons Mining Project since 1978 under authority of the Fish and Wildlife Coordination Act. Their final report with findings and recommendations for mitigation measures to compensate for fish and wildlife habitat losses has been sent to the Forest Service. The FWS has documented its concerns and offered recommendations to the FS to resolve any wildlife issues during the planning process. The statement does not appear to recognize these efforts and those of the Colorado Division of Wildlife.

We are concerned that the proposal does not include adequate means and measures to mitigate project-caused losses of wetlands, elk winter range, fish resources and their habitat, stream losses caused by reservoirs and/or culverts, or provide adequate compensation for short- or long-term adverse impacts to the continued usefulness of the Roaring Judy Fish Hatchery. These concerns are covered in more detail in the attached comments.

It appears that the FS considers the land exchange as mitigating some of the wildlife and wetlands losses. This is not necessarily so. There are two separate and distinct accounts to be satisfied - fair market value in the land exchange and replacement of the wildlife or wetlands values lost. A change in ownership of existing wetlands or prime wildlife habitat does not necessarily replace or mitigate losses. This would be acceptable mitigation only if the acquired lands were in actual danger of development. Normally mitigation will consist of creating new wetlands, improving stream habitat or otherwise providing new or enhanced wildlife habitat.

The statement lacks adequate information for a full understanding of how the section 404 permits from the Corps of Engineers (COE) may effect fish and wildlife resources. Accordingly, our comments now do not preclude separate evaluation and comments by the FWS when reviewing the permit applications. The COE permits are currently being reviewed by the FWS Salt Lake City Area Office.

Cultural Resources

The statement indicates (p. 113) that "tailings deposition on some Class I and III sites may be viewed as constituting avoidance since it protects and preserves these resources for scientific study at a later date." We do not agree that tailings deposition will necessarily protect and preserve sites. We are not aware of studies indicating the chemical action of tailings on archeological sites.

The EIS indicates that the Forest Service will prepare a memorandum of agreement for avoidance or mitigation of effects on cultural resource sites. We suggest that the statement specify that the proposed memorandum of agreement would be a part of the Section 106 process, in consultation with the Advisory Council on Historic Preservation.

Tailings Disposal

The statement should provide the design criteria for the tailings dam, the physical and chemical characteristics of the tailings, and detailed site analyses as to potential

4-3

All reasonable suggestions for modifying and mitigating Project effects have been carefully considered, all reasonable mitigation measures under the jurisdiction of the Forest Service have been adopted to minimize impacts on wildlife. In addition, the decisions of other authorities can also address these concerns. However, to the extent that Forest Service jurisdiction allows, the Forest Service will cooperate in resolving these concerns.

4-4

This has been added to the FEIS.

4-5

This mitigation strategy has been deleted from the FEIS.

4-6

Dam design information is presented on DEIS pp. 154, 159, 330, and 337. Chemical analyses of tailing are in CDM (1980q Appendix E). Site analyses are summarized on DEIS pp. 92-93, with more detail being in CDM (1980a) and Robinson (1980). Stability is discussed on DEIS p. 154. These situations are available through the microfiche system discussed on DEIS pp. 6-7.

LETTER 4 (continued)

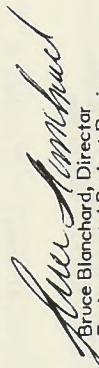
FOREST SERVICE RESPONSES

Jimmy R. Wilkins, Forest Supervisor

hazards. Based on this information, the probability of partial or total failure should be analyzed and the possible impacts to resources downstream discussed.

We appreciate the opportunity to review and comment on the statement. The cooperating bureaus will continue to work with you as needed in preparing the final statement.

Sincerely,


Bruce Blanchard, Director
Environmental Project Review

Enclosure

3 } 6

LETTER 4 (continued)

FOREST SERVICE RESPONSES

Specific Comments

Page xviii, paragraph 3. This paragraph describes possible acid seepage caused by mining molybdenum on Mount Emmons under Alternatives 2-7. The concluding sentences in that paragraph state, "Past-mining control measures that could be taken have been discussed by AMAX. The technology of acid drainage control and prevention is improving steadily and new methods may become applicable in the future." AMAX should provide state-of-the-art monitoring and control of acid drainage both during and after mining as part of their operating and reclamation plan. This should be subject to periodic review and update as necessary.

Page xix, paragraph 2, in its entirety. We disagree with the statement, "The risk of contamination of the Hatchery's water supply is low." We believe there is a high risk of polluting the Hatchery's water supply in both the short and long terms. Accidental spills and concentrations of pollutants released during winter thaws or spring runoff reaching the water supply is possible. Treatment system failures at AMAX's Climax operations have been reported by the Colorado Department of Health. Fish kills also have been reported below the Climax Molybdenum mill by the CDOW. Similar failures are possible at Alkali Creek. We believe long-term pollution from percolation, infiltration, or leaching of toxic materials in Alkali Basin is also possible.

Page 29, Wildlife, paragraph 1, second sentence states, "Placement of the mill-tailings area in Alkali Creek (Alternative 2-4) will disrupt this migration pattern, but the effect is not expected to be significant." This needs to be qualified. Worst case analyses indicates that the entire herd may be lost. This may not be significant on a regional basis but it is certainly significant locally.

Page 29, Wildlife, Wildlife Impact Index bar graph. We question the validity of showing Alternative 7 as having the greatest wildlife impact. The rationale for this determination cannot be ascertained from Appendix 1. The determination documented in the FWCA report shows Alternative 7 to have lesser impacts on wildlife than Alternatives 2-6.

Page 29, Wildlife, paragraph 4, first sentence states, Alternative 7 will displace an estimated 1,440 sage grouse...." We question this estimate and Appendix 1 does not help clarify the statement. According to CDOW records, strutting ground counts based on 19 years of records ranged from 0-177 males, averaging 38 per year in Chance Gulch. A breeding population of 38 pairs (represented by 38 males) could only result in a maximum population of about 135 birds. The CDOW also has collected sage grouse wings from hunter-killed birds at Six Mile Lane which controls access to not only Chance Gulch, but a much larger area. Wings collected at this point over the last 3 years averaged 20. According to CDOW studies, 70 percent of the birds harvested would be represented by the number of wings collected at this point. Further CDOW studies by Braun shows the harvest of sage grouse represents about 10 percent of the population. Based on these criteria, there would have been about 30 birds harvested out of an overall population of about 300 birds. It is our conclusion that Chance Gulch would be expected to have no more than about 150 sage grouse, rather than the 1,440 reported. This change should be made throughout the document.

Page 51, Mill Areas, Alkali Basin, paragraph 5, states, "Although Alkali Basin is not big game winter range...." This statement needs clarification. According to CDOW records,

7

4-7

The Forest Service agrees that the risks identified are possible. It does not agree that the risks are high. The cited paragraph is in the Summary. Additional information behind the paragraph's conclusions is on DEIS p. 154 and in Response 2-5.

8

4-8

The analyses supporting this conclusion are presented on DEIS pp. 149-151.

9

4-9

The Forest Service believes the methodology used in developing this graph adequately assesses the impacts on all wildlife in a broad context. The approach is sensitive to acres of habitat disturbed, which the graph on DEIS p. 28 shows is greatest for Alternative 7. The FWCA report is in FEIS Appendix K.

10

4-10

These numbers have been revised. See FEIS p. xxiii.

11

4-11

This topic was explained more thoroughly on DEIS p. 149. The sentence referenced by this comment has been revised. See FEIS p. xxiii.

LETTER 4 (continued)

2

Alkali Basin is important big game early winter range and serves as winter range through most of the milder winters. This is important because without this early winter use, the winter range used only during the most severe winter conditions could not support the herd alone over a number of years if it was not relieved by Alkali Basin's contribution.

Page 51, Chance Gulch, and continuing on page 52. The discussion in this section contradicts the Wildlife Impact Index (bar graph) on page 29.

Page 51, Mill Areas, Alkali Basin, paragraph 4. This paragraph under evaluates the importance of summer brood range for sage grouse. Sage grouse researchers have reported the importance of summer brood habitat for sage grouse. The FWCA report documents this importance.

Page 52, second paragraph under Chance Gulch states, "According to the CDOW, 11 sage grouse leks...." The correct number is 4, not 11.

Page 106, Aquatic Ecology. This section fails to address the environmental consequences of changing stream habitat to reservoir habitat on 1,400 feet of Elk Creek and 2,125 feet of Carbon Creek, and the effects of routing the following stream lengths through culverts; Coal Creek, 3,300 feet; Carbon Creek, 600 feet; and Coal Creek, 200 feet. It should be noted in this analysis that these culverts may be effective barriers to upstream movement of fish.

It appears there is a potential for toxic materials to leach from the fill into the stream. This potential is believed to be high, especially where some or all of the fill will come from the mine area such as that to be used on Coal Creek (400,000 cubic yards) and Elk Creek (585,000 cubic yards). These fill-source formations are known for their potential acid and elemental toxicity to aquatic life. We believe this potential needs to be assessed to determine the need for monitoring once construction begins. If impacts are likely, mitigation measure should be formulated to control this toxicity to aquatic life.

Page 160, Sails, last paragraph. It is not clear whether this mitigation will be required and how it was considered in impact analysis.

Page 163, Aquatic Ecology, paragraph 3. The environmental consequences of the culverts should be discussed. What impacts to the aquatic environment would the culverts on Carbon Creek have? What would the environmental consequences be to the aquatic environment on that section of Carbon Creek that would be transformed from stream to reservoir? What would be the effects of 660,000 cubic yards of railroad fill on the Carbon Creek aquatic environment? These are some of the environmental consequences that need to be addressed in this chapter and section.

Page 164, Surface Water, beginning with the last sentence and continuing on page 165 states, "Possible ways of mitigating...." It is not clear what mitigation will be required or how it was considered in impact analysis.

Page 186, Elk and Deer, paragraph 1, first sentence states, "Chance Gulch is recognized as winter range for both deer and elk." The CDOW does not class it as deer or elk winter range. What record does the FS have on deer and elk winter use for the Chance Gulch mill and tailings site, to substantiate this statement?

FOREST SERVICE RESPONSES

4-12

This is not a contradiction. See Response 4-9.

11

4-13

The DEIS recognizes sage grouse use of all habitats in Alkali Basin. This recognition is adequate for the purpose of describing the affected environment.

12

13

4-14

This has been corrected. See FEIS p. xxiii.

14

4-15

It is inappropriate to address these site specific impacts in the General Impacts section. The environmental consequences of the proposed reservoirs on aquatic environments are discussed on DEIS p. 250. The environmental consequences of the culverts are discussed on DEIS pp. 163-165 and FEIS p. 12.

15

4-16

The Forest Service does not feel the potential is high, as discussed on FEIS pp. 12-13.

16

4-17

Mitigation requirements for activities on NFS lands will be specified in the Forest Service Record of Decision.

17

4-18

The discussions in this section and other sections of the FEIS are considered adequate for a reasoned choice among the alternatives. See Responses 1-5 and 4-15.

18

4-19

Mitigation requirements for activities on NFS land will be specified in the Forest Service Record of Decision. The mitigations listed are considered adequate for eliminating the risk of suspended sediment impacts generated by the Coal Creek fill on the Town of Crested Butte's water intake.

19

4-20

These statements are based on maps in Forest Service, 1976. This document was developed in cooperation with local CDOW personnel.

20

LETTER 4 (continued)

FOREST SERVICE RESPONSES

3

Page 186, Elk and Deer, paragraph 1, last sentence states, "This impact could be partially mitigated...." Will this mitigation be required?

Page 187, Sage Grouse. We disagree with this assessment. See our previous comments.

Page 253, Wildlife. We disagree with the conclusions of this section as discussed in several items above. The FWCA report provides our assessment of wildlife impacts and the findings of that report should be incorporated into the final impact statement.

Page 252-254. The Relationship Between Short-Term Uses of Man's Environment and the Maintenance and Enhancement of Long-Term Productivity. There would be long-term impacts to the aquatic environment that need to be discussed in this section. This should include long-term impacts caused by culverts, reservoirs, and downstream flow changes below project reservoirs.

Page 280, Table 7.2-6, Summary of Vegetation Mitigation Measures for the Proposed Project. We do not view the proposal to mitigate the loss of wetlands by transferring 331 acres of wetlands from private to public lands as adequate. This is discussed further in our final FWCA report.

Page 280, paragraph 2 under 7.2.2.2, Wildlife and Big Game, beginning on page 279 states, "Lands purchased for exchange contain wildlife and big game...." We assume the paragraph is intended to imply the exchange lands would mitigate elk or other wildlife losses. We do not agree. There has been no evidence presented to show that the exchange lands would increase elk winter range needs by 240 AUMS to replace those lost (See LAND EXCHANGE, DEIS, pages 237-248). Mitigation must be a demonstrable gain in AUMS for elk. Only the gained AUMS for elk above the existing conditions can be considered mitigation. A mere change in ownership does not avoid, reduce, or compensate for project-caused losses.

Page 280-284, 7.2.2.3, Aquatic Ecology, and Table 7.2-9 on Page 285. We believe that provisions should be made to mitigate possible project caused damages to the Roaring Judy Fish Hatchery, losses to fish or their habitat and losses of streams because of reservoirs and culverts. Mitigation should include assurances of adequate downstream flows for fishes below reservoirs, and means for controlling acid drainage following project closure.

Page 303, Table B-1, Mitigation Proposed for Vegetation Destruction and Alteration, in part includes, "Monitor molybdenum levels...." Monitoring alone does not avoid, reduce, or compensate an adverse impact. Who will be responsible for the monitoring, the criteria and any corrective action?

Page 303, Table B-1, Mitigation Proposed for Vegetation Destruction and Alteration, in part includes, "Purchase existing wetlands...." This would not avoid, reduce, or adequately compensate for wetland losses.

Page 304, Table B-1, Mitigation Proposed for Impacts Related to Activities in Wetland Areas, states, "Place wetlands in public domain...." Land trade alone does not constitute mitigation. See previous comments on the topic.

21

4-21

This only constitutes a suggested mitigation measure. The Forest Service Record of Decision will describe the mitigation measures that will be required.

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4-22

This section has been revised. See FEIS pp. 18-19.

23

4-23

The mitigation measures in DEIS Tables 7.2-10, B-2 and B-5 provide the necessary mitigation.

24

4-24

The answers to these questions depend on the authority eventually requiring the monitoring. If the Forest Service Record of Decision requires monitoring, it will also address responsibility.

LETTER 4 (continued)

4
Page 306, Table B-2, Wildlife Mitigation Measures. Mitigation proposed for impacts on big game habitat...includes in part, "Purchase of winter range areas..." This is mitigation only if it can be demonstrated that the action would replace AUMS or animal units lost.

25
Page 307, Table B-2, Wildlife Mitigation Measures. Mitigation proposal for impacts on big game habitat...includes, "Increased productivity of existing winter range area..." Nowhere in the DEIS has it been demonstrated how much of the lost elk AUMS would be replaced or where this would occur. Mitigation measures must be shown to contribute to replacement of project-caused losses.

26
Page 309, Table B-3, Aquatic Ecology Mitigation Measures. There are no mitigation measures proposed to compensate for damage to fish or fish habitat that may result from project-caused acid drainage pollution during or following project operation, and for streams lost to culverts and reservoirs. We consider these mitigation measures necessary to reduce impacts to fishery resources and fish habitat.

4-25

Specifics on "how much and where" can only be determined after an alternative is selected and final designs are approved. It is assumed, however, that if the mitigation measures are required, they will occur in the upper Garnison Basin.

4-26

The mitigation of acid drainage pollution is discussed on DEIS pp. 109, 154, 176, 188, 310 and 311. In consideration of these discussions, the chance for damage to fish or fish habitat from acid drainage pollution is expected to be low. Some fish habitat may be lost where culverts are installed; however, two mitigation measures in Table B-3: "restore and enhance lower Coal Creek fishery habitat" and, "participate with Trout Unlimited in stream improvement projects in the area", will mitigate these effects. The portions of stream where the Elk Creek and Alkali Creek reservoirs are proposed do not support fisheries. The portion of Carbon Creek where the reservoir is proposed supports only a marginal fishery at best. The reservoirs would most likely enhance the fisheries at these locations.

Advisory Council On Historic Preservation

1522 K Street, NW
Washington, DC 20005

Reply to:

Lake Plaza South, Suite 616
44 Union Boulevard
Lakewood, CO 80228

January 29, 1982

Mr. Jimmy R. Wilkins
Forest Supervisor
Forest Service
1063 Main Street
Delta, CO 81416

Dear Mr. Wilkins:

On January 25, 1982, the Council received your request for comments on the draft environmental statement (DES) for the Mount Emmons Mining Project, Crested Butte vicinity, Colorado. Pursuant to Section 102(2)(C) of the National Environmental Policy Act of 1969 and the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR 800), we have determined that your DES does not demonstrate compliance with Section 106 of the National Historic Preservation Act of 1966.

Section 106 requires that FS obtain the comments of the Council when its actions will affect any historic (archeological, historic, or architectural) property included in or eligible for inclusion in the National Register of Historic Places. This requirement extends to any historic property regardless of whether it is on land under the control or jurisdiction of FS, another agency, or in private ownership. The steps to be followed in obtaining Council comment are detailed in the Council's regulations. Since your DES states that historic properties eligible for the National Register will be affected by the Mount Emmons Project the Council looks forward to working with FS in accordance with 36 CFR Part 800 at the earliest possible opportunity to assure adequate and meaningful consideration of alternatives to avoid, minimize, or mitigate any adverse effects to historic properties.

We believe the best planning effort for cultural properties, as part of the environmental planning process, can be obtained if the consultation process detailed in the Council's regulations is completed prior to publication of a final environmental statement or the making of any decision which would foreclose the consideration of alternative methods of treatment for historic properties.

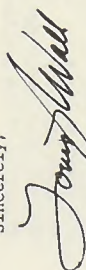
The Forest Service recognizes its responsibilities under Section 106 of the National Historic Preservation Act and will seek Advisory Council comment on requests for determinations of eligibility for potential National Register of Historic Places on Federally administered land, and on mitigation plans for those resources which are determined to be eligible and which may be impacted by the Project. The steps of determining eligibility and of preparing a mitigation plan will be implemented as soon as the areas to be impacted are known.

Further discussion is on FEIS pp. 9-10.

2

Please contact Dr. Brit Allan Storey of my staff as soon as possible to initiate your compliance with Section 106.

Sincerely,



Louis S. Wall
Chief, Western Division
of Project Review



DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT
REGIONAL/AREA OFFICE
EXECUTIVE TOWER - 1405 CURTIS STREET
DENVER, COLORADO 80202

February 5, 1982

REGION VIII

Mr. Jimmy R. Wilkins
Forest Supervisor
U.S. Forest Service
1063 Main Street
Delta, Colorado 81416

Dear Mr. Wilkins:

Thank you for the opportunity to review and comment on the draft Environmental Impact Statement (EIS) for the Mount Emmons Molybdenum Mining and Milling Project, Gunnison County, Colorado.

Your draft EIS has been reviewed with specific consideration for the areas of responsibility assigned to the Department of Housing and Urban Development (HUD). This review considered the proposals compatibility with local and regional comprehensive planning and impacts on urbanized areas.

This AMAX proposal is anticipated to add 6,777 persons to the number already residing in Gunnison County by the year 1994 (Table 4-48). This would mean well over 2,000 new housing units must be constructed to accommodate this growth. If 50 percent of the water used by these new households is depleted from the stream flows, an estimated 350 acre-feet of water would be lost to downstream. HUD has been made aware that any depletion of the Upper Basin of the Colorado River may have serious consequences on the "endangered" fish of the Colorado River. A Biological Opinion by the U.S. Fish and Wildlife Service is required for any proposal which might effect the fish habitat by depletion of the available water flows.

The United States Fish and Wildlife Service has an interim process for the development of any Biological Opinion because of these "endangered" fish. A portion of this process is that there is a formula to determine the specific amount of financial compensation for the implementation of a conservation plan for these fish. The compensation is based upon the project's annual water depletion

It would appear that this proposal should receive a Biological Opinion of not only the water used by AMAX, but that projected by the projected housing units.

IN REPLY REFER TO:
8CQ -0437

6-1

The Fish and Wildlife Service, in accordance with the Endangered Species Act of 1973 and subsequent amendments, has reviewed a biological assessment submitted by the Forest Service and concurred that the Project will not impact any listed species.

2

We concur that housing of both temporary and permanent employees in Gunnison County will create a real strain on the local housing markets. The various mitigation AMAX has already started in the area will go a great way in lessening the impact on the local communities.

If you have any questions regarding these comments, please contact Mr. Carroll F. Goodwin, Area Environmental Officer at (303) 837-3102.

Sincerely,

Robert J. Matuschek
Robert J. Matuschek

Director
Office of Regional Community
Planning and Development

LETTER 7

FOREST SERVICE RESPONSES



DEPARTMENT OF HEALTH & HUMAN SERVICES

Office of the
Principal Regional Official

Region VIII
Federal Office Building
1961 Stout Street
Denver, CO 80294
ROFEC

March 11, 1982


Mr. Jimmy R. Wilkins
United States Forest Service
1063 Main Street
Delta, Colorado 81416

Dear Mr. Wilkins:

We have reviewed the Draft Environmental Impact Statement on the proposed Mount Emmons Mining Project in Gunnison County, Colorado.

The DEIS references the need for additional social services workload. However, there was no specific mention of a needs assessment or a plan for meeting the social service requirements.

Sincerely yours,


E. W. McIntire
Director, ROFEC

1

7-1

This information is presented in Chapter 7 of EML (1981a,c,d), which is available in the microfiche reference system discussed on DEIS pp. 6-7.

LETTER 8



FEDERAL HIGHWAY ADMINISTRATION
REGION EIGHT
Colorado Division
Post Office Box 25406
Denver Federal Center, Building 25
Denver, Colorado 80225
March 4, 1982

IN REPLY, REFER TO
HPD-CO
434

Mr. Jimmy R. Wilkins
Forest Supervisor
U.S. Forest Service
1063 Main Street
Delta, Colorado 81416

Dear Mr. Wilkins:

Subject: 02-04-81-03

The Colorado Division Office of FHWA has conducted a review of the Draft EIS for the Mt. Emmons Project, Gunnison, Colorado and has no substantial comment. The DEIS adequately addresses highway traffic.

Thank you for the opportunity to provide comments on this document.

Sincerely yours,

A. J. Siccardi

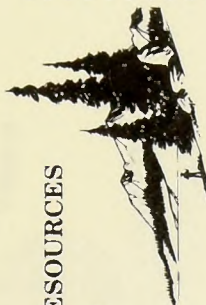
A. J. Siccardi
Division Administrator

COLORADO STATE AGENCY COMMENTS

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LETTER 9

STATE OF COLORADO RICHARD O Governor
DEPARTMENT OF NATURAL RESOURCES
O. MONTE PASCOE, Executive Director
1313 Sherman St., Room 718, Denver, Colorado 80203 866-3311



Board of Land Commissioners
Division of Administration
Division of Mines
Division of Parks & Outdoor Recreation
Division of Water Resources
Division of Wildlife
Geological Survey
Oil and Gas Conservation Commission
Soil Conservation Board
Water Conservation Board
Mined Land Reclamation

March 18, 1982

Mr. Jimmy Wilkins
Forest Supervisor
Grand Mesa, Uncompahgre, &
Gunnison National Forests
P. O. Box 138
Delta, Colorado 81416

Dear Mr. Wilkins:

Thank you for providing State agencies the opportunity to review and comment on the Mount Emons Mining Project Draft Environmental Impact Statement (DEIS).

Attached are individual State agencies' comments on the DEIS. We hope that this comprehensive set of State comments will facilitate the fulfillment of the Forest Services' responsibilities under the National Environmental Policy Act. The attached letters reflect not only the agencies' review of the DEIS but their involvement with the Mount Emons project over the past four years as well. I am confident you will give each comment your full consideration.

State agencies' comments, including the U. S. Fish and Wildlife Coordination Report, with which the Colorado Division of Wildlife concurs (February 10, 1982 letter from Jack R. Grieb, Director, Division of Wildlife to William White, Acting Area Manager, U. S. Fish and Wildlife Service), cite a number of concerns about the questions that are discussed, or should be discussed, in the DEIS. A number of suggestions for strengthening the mitigation measures are also included.

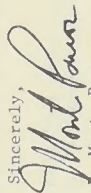
Because it appeared that substantial revisions to the document, based on the comments of State agencies, may be appropriate, we considered suggesting the DEIS be treated as a preliminary draft. However, instead, I would suggest that a preliminary draft of the FEIS be reviewed by appropriate federal, state, and local agencies to insure that the identified concerns are adequately addressed. Such a review prior to the filing of the final document and Record of Decision would help assure a satisfactory conclusion to the writing of this extensive document.

LETTER 9 (continued)

Page Two
March 18, 1982

I hope these comments are helpful. The State of Colorado has appreciated the Forest Service's willingness to work closely with State agencies on this extremely complex project review, and we look forward to continuing this close working relationship in the final phase.

Sincerely,


Monte Pascoe
Executive Director

Attachments

cc: Craig Rupp

DMP/ljc

LETTER 10

FOREST SERVICE RESPONSES

D. LAMM
ANCH



COLORADO GEOLOGICAL SURVEY
DEPARTMENT OF NATURAL RESOURCES
715 STATE CENTENNIAL BUILDING — 1313 SHERMAN STREET
DENVER, COLORADO 80203 PHONE (303) 866-2611

JOHN W. ROLD
DIRECTOR

February 22, 1982

TO: Adam Poe, Colorado Joint Review Process Coordinator
FROM: *James M. Soule*
James M. Soule, Colorado Geological Survey
SUBJECT: Mt. Emmons Mining Project Draft Environmental Impact Statement (DEIS)

We have received and reviewed the subject DEIS.

Generally we find that the summary discussions of geotechnical problems that this project will encounter/create barely adequate for the intended purpose of the document. They appear to be consistent with the discussions of other environmental factors however. The details of geotechnical problems of both the ore-haulage route(s) and method(s) and tailings disposal sites are hardly mentioned in the document. Because much of the viability of the project and siting considerations of the project's facilities are dependent on safe, uninterrupted ore-haulage and safe tailings disposal, we think that more involved and detailed analyses of these problems and their proposed solutions should be presented in the DEIS.

10-1

The DEIS discussion of this material was abbreviated in the interest of reducing paperwork. Considerably more detail is available in the references listed on DEIS page 90, and in Soule (1976).

1

cc: Jimmy Wilkins
Steve Ellis

LETTER 11

STATE OF COLORADO
Richard D. Lamm, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
Jack R. Grieb, Director
6060 Broadway
Denver, Colorado 80216 (825-1192)



March 1, 1982

Mr. Adam Poe
Program Director, J.R.P.
Dept. of Natural Resources
Executive Director's Office
1313 Sherman Street
Denver, Colorado 80203

Dear Adam:

Enclosed with this letter are the Division of Wildlife's comments on the Mt. Emmons Draft Environmental Impact Statement. As you are well aware, our Division has been working on this project since inception. We have spent countless hours analyzing the impacts the project will have on wildlife, wildlife habitat and the benefits the general public receives from wildlife. The project is immense in size and will have very significant impacts on the wildlife resources in the Gunnison Basin.

The Division of Wildlife, in coordination with the U. S. Fish and Wildlife Service, has taken a position on the project from an early state, and we have not changed that position. We support a Chance Gulch Mill and tailing site and East River transportation corridor. We all support a full wildlife mitigation program to offset impacts of the project. Specific concerns and comments on the D.E.I.S. are attached.

I would like to take this opportunity to commend you and the people involved with the Joint Review Process for an outstanding job done on this project and others located in northwest Colorado. We have been well informed on what's going on and have had ample time for coordination and comments.

Keep up the good work!

Sincerely,

Jack R. Grieb
Jack R. Grieb
Director

JRG:mg

Encls.

cc: U.S.F.W.S. - Salt Lake
Ecological Services
Bob Rosette

DEPARTMENT OF NATURAL RESOURCES, Monte Pascoe, Executive Director • WILDLIFE COMMISSION, Donald Fernandez, Chairman
James Smith, Vice Chairman • Richard Olivebiss, Secretary • Jean K. Tool, Member • James C. Kennedy, Member
Michael Higbee, Member • Sam Caudill, Member • Wilbur Redden, Member

LETTER 11 (continued)

DIVISION OF WILDLIFE COMMENTS ON THE MOUNT EMMONS
DRAFT ENVIRONMENTAL IMPACT STATEMENT
AS SUBMITTED TO THE DEPARTMENT OF NATURAL RESOURCES
MARCH 1982

The Colorado Division of Wildlife has been integrally involved throughout the study and planning stages of AMAX, Incorporated's Mount Emmons Molybdenum Project. This project, if developed, will be the largest man-made development in the history of Southwestern Colorado. The project as proposed by AMAX, Inc. is immense in size and will have significant adverse impacts on wildlife, wildlife habitat, and the associated enjoyments people derive from wildlife. Physical development of the project will affect vegetative cover, open space, water quality, and other requirements necessary to support many wildlife species. Secondary impacts of the project (human population growth and development) will magnify the problems and impacts many times and have an even greater impact on wildlife. Even with wise planning, coordination, mitigation and enhancement, the project will have tremendous direct and indirect impacts on wildlife.

The Division of Wildlife does not promote industrial development in wildlife areas. Optimally, we support a no action alternative on projects which will have adverse wildlife impacts. Realistically, however, we realize the social and economic benefits of industry and have viewed the Mount Emmons Project with those factors in mind. As a result, the Division of Wildlife has supported an alternative which will allow development of the Mount Emmons Project with those factors in mind. As a result, the Division of Wildlife has supported an alternative which will allow development of the Mount Emmons molybdenum ore body and have less adverse impacts to wildlife. Our Division initially recommended Alternative #7 and we still support it.

Throughout the planning process, DOW has recommended an ore haulage corridor along the East River Valley and a mill-tailings site in Chance Gulch. These areas were considered because of existing and planned development, relative values for wildlife and minimizing human and physical impacts on wildlife from primary and secondary impacts.

It must be clearly understood that all proposals and alternatives, except the "no action" alternative, will have severe impacts on wildlife, if implemented. The Chance Gulch alternative will have fewer impacts. It is interesting to note that an independent study by the Harvard University Graduate School of Design recommended Alternative #7 as the alternative having the least impact on the environment. The DEIS should note this during discussion of Alternative #7.

Overall, the DEIS has good format and mitigation recommendations, but the alternatives are not analyzed equally. A great deal of information provided by AMAX, DOW, and USFWS is not presented in the DEIS. The

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 2 -

Cooperative Elk Research Project sponsored by AMAX is an example of information which was important and factual but not heavily considered during the tailing sites analysis. Bibliographic research will support the avoidance factor of big game to industry in other states with large mining operations. This should be considered in the final EIS.

In large projects like Mount Emmons, secondary impacts on wildlife, are usually more severe than the primary developments. Additional human development and encroachment associated with Mount Emmons will have a greater impact on wildlife than the actual development of the mine. It is a key planning tool in land use development to reduce physical and environmental impacts by confining development to already impacted areas. The proposal and Alternatives 3-6 do not seriously consider reducing environmental impacts by maximizing the use of already impacted corridors. This is a serious deficiency and should be corrected in the EIS. AMAX will affect secondary growth in Gunnison County. NEPA requires careful analysis of all impacts affecting the human or natural environment in an EIS. Consideration for secondary development of new housing, roads, sanitation facilities, power transmission routes, new recreation demand, etc., is just as important to discuss as the primary development facilities and their impacts.

The preceding comments are made as an introductory statement of some of the DOW's major concerns. The remaining comments are specific to the DEIS and relate to the page of discussion.

Page XVIII, Paragraph 3. Acid seepage control.

Proven acid control should be guaranteed throughout the project and post reclamation to guarantee future high water quality. Specific techniques for control should be presented as part of the water quality control and reclamation plan. This should be a standard part of the operation plan, guaranteeing the public that AMAX can control any problems they create, in perpetuity.

Page XIX, Paragraph 2.

DOW disagrees with this statement. Any type of surface discharge from an accidental spill could affect Roaring Judy's water supply. We have not found a tailings pond yet that hasn't had some type of chemical affect on the surrounding environment. Accidental chemical spills near the river, wind blown ore or uncontrolled runoff of pollutants collected in the watershed throughout the year, could all have an impact on Roaring Judy's water supply. Currently, Roaring Judy is not at full capacity because of a shortage of available water which has the proper chemical and physical properties to raise fish at an optimum level. If alternative water is readily available for Roaring Judy, the location, quantity and quality of this water should be outlined in the final EIS. It should be stated who will pay for the replacement water if something does happen to Roaring Judy's present water supply as a result of AMAX, Inc.

The records of AMAX's NPDES permits at other large mines in Colorado should be closely inspected before stating that contamination from an Alkali Creek tailings pond will have a low risk of contaminating Roaring

11-1

Many reports and much detailed information could not be reprinted in the DEIS. The cooperative elk research project was noted as containing detailed wildlife information and was incorporated by reference (DEIS p. 50). This report was very significant in identifying the elk use in the Project area that is discussed throughout Chapter 4 of the DEIS.

Reports in the Mt. Emmons files (e.g., Glover, 1981, and Lyon, 1975) indicate controversy regarding the response of deer and elk to human activities. This was recognized on DEIS p. 149 and a worst-case analysis was presented on DEIS p. 151.

11-2

The alternatives in the DEIS constitute a reasonable range of alternatives. It does not constitute a deficiency for one alternative to disturb more new corridor than another. Each alternative has some negative and some positive aspects. The degree to which each alternative maximizes the use of already-impacted corridors is one criterion that can be used in a decision. The information concerning newly-impacted areas is available in the DEIS. A specific comparison of common corridor miles can be found in DEIS Table 2-3, p. 35

11-3

Secondary impacts on wildlife were analyzed and discussed on DEIS pp. xx, 104, 105 and 106.

11-4

Mitigation and reclamation requirements for activities on NFS lands will be specified in the Forest Service Record of Decision. Bonding for reclamation will be required as specified in the Record of Decision.

11-5

The alternative source identified is the East River (DEIS p. 154). The question of who will pay has not been determined.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 3 -

Judy's water supply. If Alkali Creek is developed as a tailings pond, our Division wants a full guarantee by legal bonding that Roaring Judy, its water supply and fish will be replaced in kind by AMAX, Inc. if any AMAX liable damage is done to the unit.

Page XIX, Paragraph 6.

We disagree with the statement that "Placement of the mill-tailings area in Alkali Creek is not expected to have a significant impact on elk migration." Associated activities with the mill-tailings (such as 1,000 acres of tailings, approximately 1,000 vehicle trips per construction day, eight miles of access roads, 7.7 miles of railroad, and 18 trains per day) will have a major impact on elk migration in the Red Mountain-Alkali Creek area. What evidence is there to conclude that an Alkali Creek mill-tailings site will only have an insignificant impact on elk migration?

Pages 9-27.

Our Division does not concur with any of the alternatives for power supply configuration. We feel development should be kept in the development corridors to reduce environmental impacts. We support a combination of Alternatives 4 and 7 which would keep transmission lines routed along US 135 and US 50, using the Chance Gulch alternative.

Current power line configurations route a line over Kebler Pass, down Anthracite Creek and the North Fork of the Gunnison River. The power supply would have come from Colorado-Ute's proposed 345 kv line, which was recently disapproved by the Public Utilities Commission. This power source is no longer available and should be discussed in the final EIS. It is also important to note that a power transmission route across Kebler Pass would be almost as controversial as the main part of the Mount Emmons Project. Kebler Pass is an outstanding wildlife area and the gateway to both the West Elk Wilderness and Raggeds Wilderness areas. The DEIS does not detail the impacts this transmission line will have on the environment. Complete details and impacts of the route should be included in the final EIS. Burying the transmission line should be one of the alternatives considered.

Comparison of Alternatives Pages 28-44.

The bar graph on page 29 indicates largest wildlife impacts to be on Chance Gulch alternative. As indicated in Appendix I, this is a totally academic approach to wildlife values. All wildlife species are weighed equally. This could be valid in certain applications, however, it is inappropriate here. This bar graph gives misleading assumptions to most readers. Also on page 29, the statement is made regarding 1,440 sage grouse displaced from Chance Gulch. This figure is attributed to the BLM. It is also wrong: A gross exaggeration which could not be proven. Here are the DOW facts of Chance Gulch sage grouse. Lek counts have been made here for 19 years. Birds counted range from 0-177 with an average of 38.42. A wing barrel has been placed on 6 Mile Lane since 1979.

6

11-6

The sentence quoted actually reads "Placement of the mill-tailing area in Alkali Creek (Alternatives 2-4) will disrupt this migration pattern, but the effect is not expected to be significant." This is a summary statement, supported by worst-case analysis on DEIS, p. 151.

7

11-7

This has been added. See FEIS Appendix D and Response 3-18.

11-8

For the purpose of selecting between alternative power supply corridor configurations, the DEIS adequately analyzes impacts. These analyses are presented through the use of indices on DEIS pp. 234, 235 and 35, and with other data on pp. 34, 35, and 223-236. The background studies used to develop the indices are described in GIM (1980 e-n).

8

Burying the transmission line is considered in Alternative 6 and analyzed on DEIS pp. 229-232.

11-9

As Appendix I indicates, the analysis was performed in response to the public issue that impacts on all wildlife should be considered in a broad context. The assumptions and methodology are thoroughly explained in DEIS Appendix I. There have been no substantive comments on the DEIS identifying logical flaws in the methodology. Therefore, this approach is considered an appropriate response to the public issue.

9

10

11-10

The numbers have been revised. See FEIS p. xxiii.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 4 -

Six Mile accesses much more sage grouse habitat than just Chance Gulch. Average number of wings collected have been 14. Using Braun's North Park and Moffat County research data, the following population projection can be made:

1. 70 percent of birds killed have wing placed in barrel.
2. This would indicate a total kill of 20 birds.
3. Percent of total population harvested is 10 percent.
4. Total Population = 200 birds

This indicates that the statement made on Page 52 and referenced to DOW has been misinterpreted. Chance Gulch sage grouse concentration is not the highest in the Gunnison Valley. Ohio Creek has a much higher concentration of birds.

Page 51, Paragraph 5.

Alkali Creek is not critical big game winter range, but it does serve as transitional winter range during heavy winters and winter range in light winters. Elk will utilize available range in Alkali Creek and along the periphery of the basin during the late fall and early spring. This is important range which alleviates pressure on critical ranges. This is an important aspect for the elk herd in the area and it should be noted in the final EIS.

Page 51 and 52.

The information on these two pages dispel an earlier wildlife impact value graph on Page 29. It is clear that wildlife values in Chance Gulch are not as high as Alkali Creek or Carbon Creek.

Summer range for sage grouse broods is important as indicated by wildlife research. The value of Alkali Creek for sage grouse needs to be changed in the final EIS.

The number of sage grouse leks in Chance Gulch needs to be changed from 11 to 4, Page 52.

Page 78, Paragraph 3.

Tourism and recreation is the number one industry in Gunnison County. It should be noted that the Harvard University Study indicated that coldwater fishing would be the first recreation to diminish.

Page 106, Paragraph 2.

This paragraph should also expound on new lands AMAX will obtain specifically for wildlife mitigation. It will take more than public education and management plans to mitigate losses to wildlife.

11

11-11

See FEIS p. xxiii and Response 4-11.

11-12

See Response 4-9 and 4-12.

12

11-13

See Response 4-13. Also, the DEIS did not assign a specific value to sage grouse habitat. The statement in the DEIS was, "Sage grouse, ..., range throughout Alkali Basin during the summer and fall."

14

11-14

This has been corrected. See FEIS p. xxiii.

15

11-15

This mitigation measure is discussed in DEIS Tables 7.2-7 (Appendix A) and B-2 (Appendix B).

Page 106, Threatened and Endangered Species.

The Bald Eagle, *Haliaeetus leucocephalus*, inhabits the project area and should be discussed in this section.

Page 106, Aquatic Ecology.

This section should address the impacts of reservoirs inundating streams, stream mileage lost to culverts, increased turbidity and potential barriers to fisheries. The ecology of these streams will be changed as gradient profiles, habitat types, and physical and chemical properties of the streams change. Minimum flows below reservoirs should be discussed in this section, in addition to potential water quality problems from road and parking lot runoff and infiltration of water through low grade ore used for fills.

Page 108, last paragraph.

AMAX's NPDES record for other mines should be examined and presented in this paragraph, as an affidavit to the statement that potential for toxic spills will be quite low. Historically, this hasn't been the case.

Page 109, Acid Drainage.

A positive statement should be made that AMAX will control acid drainage. The statement that "No proposals for control have been made because the problem should not arise for decades and the technology of acid drainage control is changing rapidly," is not acceptable.

Page 110, Water Rights.

Water rights need to be discussed in detail in the DEIS. Comments on potential spills and stream siltation have consistently stated that possible toxicity is insignificant because of dilution. AMAX could divert or store enough water to create low flows in streams, reducing the dilution factor and creating serious water quality problems because of concentrated toxicity. Water rights and usage should be discussed in detail so that environmental water assessments can be effectively discussed. The final EIS should discuss AMAX's water use plan for protecting stream flows, aquatic wildlife, adjacent wetlands, and aquatic related habitats.

Page 131, Aquatic Ecology.

Placement of a 3,300 foot culvert in Coal Creek will definitely have an adverse impact on aquatic ecology. Channelization by pipeline will destroy natural velocity checks, and increase velocity, which will damage downstream fishery characteristics. Wetlands will be lost as a result of the fill and this will reduce water filtration, neutralization and buffering. The Coal Creek mine site will have adverse impacts on aquatic ecology. Potential acid drainage from the fill in Coal Creek is a problem needing discussion in this section.

16

11-16

This section deals with general impacts, those that will occur regardless of where specific facilities are located. The analysis indicated that, were the bald eagles to be impacted, it would be more related to site specific impacts. Therefore, possible bald eagle impacts were discussed on pp. 152, 193 and 308.

17

11-17

The approach used in the DEIS was to discuss direct impacts that would vary with different geographic locations under the site-specific impacts beginning on DEIS p. 129. The following table contains cross references between the topics in this comment and either the DEIS or FEIS.

Topic	DEIS p.	FEIS
Reservoir Impacts	249-251	
Culvert Impacts	163	12
Minimum Flows	250, 236	
Wetlands Runoff	132, 153, 175, 188	
Fill Drainage	164	12-13

18

19

11-18

This information is not necessary for the purposes of environmental analysis because it is not applicable to the site-specific conditions of this Project.

20

11-19

Mitigation requirements for activities on NFS lands will be specified in the Forest Service Record of Decision. The quoted sentence refers to detailed site-specific proposals; their preparation at this time would be premature.

21

11-20

The water rights situation has not been finalized. The discussion of water rights is adequate.

11-21

This is a site-specific impact which the DEIS discussed on pp. 161-165. Further discussion has been added on FEIS p. 12.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 6 -

Page 136, Outdoor Recreation

How will placement of two sections of culvert in Coal Creek, totalling 3,300 feet, not interfere with fishing?

Page 149, Elk and Deer.

The second and third sentences in this paragraph should be eliminated.

Page 151, Paragraph 4.

We don't agree with the figures for economic losses due to elk herd reduction. A more realistic loss figure, based on the value of dollars spent to harvest one elk, and reducing the harvest by 38 animals annually is \$97,800 per year, or \$2,934,000 for the life of the project (30 years). These figures are based on the level of reducing the herd harvest from 50 head to 12 head annually.

Page 151, last paragraph.

Again, we totally disagree with the statement that "The construction of the Alkali Basin mill and tailing facilities is not expected to have a significant effect on big game herds now using that area.

Page 152, Threatened and Endangered Species.

This section contradicts earlier statements that the project will not impact threatened or endangered species. This section also seems to imply that the main threat to Roaring Judy from an Alkali Creek tailings site is possible destruction of the bald eagles' food supply.

Page 154, Paragraph 3.

Under a worst case situation, if Alkali Creek tailings leakage did occur, would AMAX pay for pumping East River water from upstream and would it be satisfactory water quality and temperature to be used in the hatchery building during the critical hatching and sac fry periods. The water situation for a hatchery is complex and can't simply be corrected by pumping water from an unpolluted source. This fact needs to be clearly stated in the final EIS.

Page 164, Paragraph 1.

It should be kept in mind that a 404 permit may not be granted for a 3,300 foot fill in Coal Creek, especially considering the significance of Coal Creek's wetlands. Our Division feels a trestle across the creek is more realistic. A 400,000 cubic yard fill will require extensive mitigation, which will be expensive. Another alternative would be to put the stream on top of the fill, which would not destroy 3,300 feet of fishery, if properly constructed.

11-22

The cited discussion on DEIS p. 136 deals with impacts associated with the Coal Creek mine site. Since the site is upslope of Coal Creek, it will not interfere with fishing. The Coal Creek fill's impacts are discussed under Ore Haulage to the Alkali Creek mill, on DEIS p. 167.

11-23

The referenced sentences point out two facts about the winter range in Alkali Basin: (1) the records show disagreement over winter range classifications, and (2) the most recent evaluation does not recognize this area as critical winter range. There is no cause to eliminate these sentences from the discussion.

11-24

The earlier discussion of Threatened and Endangered impacts on DEIS p. 106 says, "No general effects..." (emphasis added), whereas the discussion on DEIS p. 152 is under a major section dealing with site specific impacts from locating a mill at Alkali Basin. There is no contradiction.

11-25

This information is incorporated into the worst-case description on FEIS p. 12.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 7 -

Page 169, Worker Access to the Alkali Creek Mill.

Access to the Alkali mill site should be strictly from the East River side. Our Division does not encourage development of a western access road as an alternative.

Page 173, Carbon Creek Mill Site.

Our Division feels a Carbon Creek mill and tailings site is totally unacceptable.

Page 186, last paragraph.

Locating a mill in Chance Gulch will definitely have less impact on deer and elk than either Alkali Creek or Carbon Creek. The statement that Chance Gulch will impact deer and elk more than Carbon Creek is wrong and should be corrected in the final EIS.

Page 187, Paragraph 2.

The number of sage grouse in Chance Gulch should be changed from 1,440 to 200.

Page 226, Wildlife.

We concur that all transmission line roads should be closed once construction is completed.

Page 229, Wildlife.

Buried transmission lines can be quickly revegetated with plant varieties beneficial to wildlife. We disagree with the statement that overhead lines create less changes for wildlife. Once the line is properly placed in the ground, and revegetation takes place, human encroachment is greatly reduced, creating fewer changes for wildlife.

Page 237, General Selected Land Impacts.

Our Division feels there are many valid points for the Forest Service retaining control over certain parcels of land which AMAX currently wishes to trade. At the conclusion of the project, AMAX could sell off valuable wildlife resources, such as the calving areas near Alkali Creek. Also, what would happen to Carbon Creek Reservoir? Will it become a private fishing lake? Will minimum stream flows be guaranteed below the reservoir? These are important questions which the Forest Service could control if special use permits are granted rather than trading land. We'd like to see AMAX make some decisions on after project plans for traded lands they hope to acquire. Without this information, it is difficult to totally evaluate the environmental impacts of the land trades.

11-26

The relative ranking of Chance Gulch impacts on deer and elk is based on the discussion of winter range, DEIS p. 186. Since winter range is a critical element in the life of the Gunnison Basin deer and elk herds, any winter range losses in Chance Gulch would create a greater adverse impact than would the summer range losses caused by a mill site in Carbon Creek.

11-27

This discussion has been revised. See FEIS p. xxiii.

11-28

The beneficial plant varieties that can be "quickly" established are usually grasses, forbes and shrubs. In the typically forested environment of the National Forests a grass, forb, shrub vegetation type would constitute a far greater habitat change than would the selective clearing described as presently employed for overhead transmission lines. Also, a grass, forb, shrub vegetation type does little to discourage human encroachment on the right-of-way. The Forest Service believes overhead transmission lines create fewer changes for wildlife.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 8 -

Page 250, Paragraph 2.

If a Carbon Creek Reservoir fishery is created, it should be open to public fishing. Definitive discussion of reservoir fluctuations, minimum flows below the reservoir, and fish stocking should all be discussed in the final EIS.

Page 253, Wildlife.

Our Division feels that the cursory discussion on wildlife impacts given in this section is not correct. The USFWS Coordination Report should be incorporated into the final EIS to adequately describe the impacts of the project on wildlife.

It is also important to note that many short-term impacts can result in changing the long-term perspective. For example, water diversions can change wetlands, riparian areas, springs and aquifers which have taken thousands of years to develop. Channelization can create velocity increases which accelerate erosion of downstream channels, associated riparian and wetland values. In most cases, natural watershed management has taken hundreds and thousands of years to evolve. A 30-year project can easily change the long-term productivity of wildlife as based to habitat.

Page 280, Paragraph 2.

Our Division does not consider exchange lands as mitigation. Unless significant changes can be made which will increase the habitat and carrying capacity on the lands as they are today, then there is no net gain in habitat available for wildlife. One hundred percent of the public land which AMAX proposes to trade for currently is in Gunnison County. Sixty-five percent of the private land they wish to trade lies outside Gunnison County. To help offset impacts, the trade lands should all be within Gunnison County and as close to the project impacts as possible. AMAX can mitigate wildlife habitat losses by purchasing key wildlife areas and enhancing the habitat. Key big game winter ranges should be purchased and developed. We encourage AMAX to enhance or build "like kind" wetlands to replace the wetlands they will destroy. Prime wetlands south of Gunnison along Tomichi Creek could be purchased and enhanced as mitigation. AMAX-owned lands should be opened to hunting, fishing, and trapping to mitigate wildlife recreation losses. This public access should be donated as a perpetual easement.

The mitigation section needs to clearly state what AMAX will do if toxic spills kill fish in the Roaring Judy Hatchery or any projected related lake, stream, or pond. Conditions of bonding should be outlined in the final EIS. If additional DOW personnel are required to offset impacts to wildlife resources, it should be clearly stated in the EIS who will pick up the tab for the extra expense.

Overall, the mitigation section implemented in the DEIS by the Forest Service is very good. Many of the statements, however, should be reworded to be absolute in nature. For example: Page 281, mitigation

11-29

A reservoir management plan has not been submitted, nor have proposals for stocking the reservoir. As the reservoir is intended for potable water storage, extreme fluctuations can be anticipated.

11-30

The U.S. Fish and Wildlife Service coordination report is incorporated into FEIS Appendix K.

11-31

Mitigation requirements for activities on NFS lands will be specified in the Forest Service Record of Decision.

LETTER 11 (continued)

FOREST SERVICE RESPONSES

- 9 -

Item 4 should read: Springs and ponds will be developed on lands not being used for construction and planted with willows and cottonwoods. More aggressive mitigation measures must be taken by AMAX if they are to offset impacts on wildlife. Our Division will be recommending extensive mitigation before any type of environmental or land use permits are issued.

Page 282, Mitigation Item 9.

This mitigation statement should be designed to allow hunting, fishing, and trapping and allow for authorized scientific collection.

Page 284, 7.2.2.5 Wetlands.

Placement of 331 acres of wetlands in public domain will not mitigate the 111 acres of wetlands destroyed by the project. There will still be a net loss of 111 acres of wetlands. Enhancement to existing wetlands or creating new ones will be the only way that species and habitat diversity will increase, and this will have to be above and beyond the 111 acre replacement.

Page 285, last item.

Establishing an emergency contingency program for spills should include restitution measures for habitat and wildlife losses.

Page 292, 7.3.1.7--Sand and Gravel Areas.

Details of sand and gravel pits should be discussed throughout the EIS. Two hundred acres of gravel pits is a major environmental issue and should be discussed in detail. The issue has been sidestepped throughout the DEIS.

Page 309, Table B-3.

Specific restitution plans should be incorporated in the emergency contingency plan for accidental spills for the protection of Roaring Judy and streams, lakes, and ponds associated with the project. Funds for monitoring and testing should be provided by AMAX in case of fish kills.

Page 365, Forest Service Options.

Our Division recommends a non-acceptance of AMAX's offer to trade lands. Current legislation surrounding the NEPA process is ineffective in guaranteeing the full protection of environmental integrity of public lands. As long as project lands are controlled by the federal government, controls can be maintained to insure protection and mitigation for impacts to the environment. Currently, the Forest Service can only make recommendations for mitigation. Mitigation needs to be written down in black and white so everyone knows exactly what to expect from a project.

11-32

32

Sand and gravel requirements and impacts are discussed on DEIS pp. 248 and 292. Specific locations for sand and gravel extraction for the Project have not yet been identified; thus, site-specific impact analyses cannot be made.

LETTER 11 (continued)

- 10 -

Summary

In conclusion, we'd like to commend the Forest Service for the development and handling of this document. It has been a difficult, expensive, and time consuming task. Although many of our comments have offered constructive criticism, we are assured that corrections will be made in the final EIS which will reflect the position of our Division and the U. S. Fish and Wildlife Service, to insure that wildlife, wildlife habitat, and the associated benefits are fully protected for the benefit of today's society and for generations to come.

LETTER 12

STATE OF COLORADO

COLORADO WATER CONSERVATION BOARD
Department of Natural Resources
823 State Centennial Building
1313 Sherman Street
Denver, Colorado 80203
Phone: (303) 866-3441



M E M O R A N D U M

Richard D. Lamm
Governor
J. William McDonald
Director
David W. Walker
Deputy Director

TO: Adam Poe
Program Director, Joint Review Process

FROM: E. I. Jencsok, P. E. *E.I.J.*
Chief, Hydrologic Investigations Section

DATE: March 5, 1982

SUBJECT: Review--Mt. Emmons EIS

Enclosed are the CWCB staff comments on the Draft EIS.

Please contact me if you have any questions or need additional information.

EIJ:cs
Enclosure

MEMORANDUM

COLORADO WATER CONSERVATION BOARD
J. William McDonald
Director

TO: Gene Jencsok
FROM: Pat Bernhardt
DATE: March 4, 1982
SUBJECT: Environmental Impact Statement for the Mt. Emmons Mining Project in Gunnison County, Colorado

The Draft Environmental Impact Statement (EIS) for AMAX's Mt. Emmons project was reviewed with attention to water supply, use, water rights and instream flows. Water quality issues were not reviewed. The consideration given water issues (not including water quality) is brief and incomplete. An overall water plan is lacking. The effect of AMAX's water use on other water users in the East River valley and the existing stream regime is not adequately addressed. These are actions that have environmental impacts of local and regional significance and should be included in an environmental impact statement.

MINIMUM STREAMFLOW ISSUES

Minimum streamflow rights received the briefest mention in this EIS. The maintenance of fisheries in Coal and Carbon Creek was discussed as part of the environmental mitigation measures, but minimum streamflow rights were not used as a reason for or a way of accomplishing this mitigation. The minimum streamflow program or the specific rights affected by this project were not discussed. There is only a brief mention that minimum streamflow requirements are not expected to be affected by AMAX's water use, which use is only described in abstract terms.

CWCB's minimum streamflow rights are as follows:

Stream	Case #	Amount (cfs)	Approp. Date
Slate River	80CW92	25	3-17-80
Coal Creek	80CW102	2	3-17-80
Cement Creek	80CW103	10	3-17-80
Mill Creek	80CW108	5	3-17-80
Carbon Creek	80CW109	3	3-17-80
Ohio Creek	80CW112	12	3-17-80

Filings in water court for minimum streamflow appropriations on the East River are to be made in 1982.

12-1

1

The water needs of the alternatives analyzed are discussed on DEIS pp. 153, 176, and 188. Water diversion and storage plans are described on DEIS pp. 12, 18, 20, 22, 24, 26, and 327-331. The impacts of water diversion are discussed on DEIS pp. 110, 153-154, 176, 188 and 250, and FEIS p. 8.

LETTER 12 (continued)

FOREST SERVICE RESPONSES

Water Use

The EIS does not spell out the water rights and priorities to be used by the mine and mill, only that they will be a mixture of junior and senior water rights and that the bulk of this water will be taken from the East River (p. 153). The consumptive use of the project is expected to be 3000 acre-feet per year. The adverse affect of this water use on other water users in the valley is cast aside with the following brief explanation.

These waters will account for about one percent of the mean annual East River flow, as measured at Almont...and far less than the one percent of the consumptive use in the upper Gunnison Basin. In addition, part of the water that will be consumed is already being consumed locally by agriculture. The site of consumption would be altered, and since some irrigation would be discontinued, a minor loss in baseflow contributions would result. This is not expected to affect either minimum flow requirements or riparian habitat.

An analysis of how these conclusions were reached is needed. Not even the most basic information such as location of diversions and rates was specified. It was necessary to refer to our case files (80CW461-5) to obtain basic information on the company's latest water rights filings, priorities and how these would affect minimum streamflows. The average water user does not have knowledge on obtaining this information. The statement that the 3000 acre-feet to be consumed by the project will be 1% of the Almont gage is insignificant. More important questions needing answers are: how much of the mean annual flow at Almont gage is appropriated and not available for future use, or how much is the result of irrigation return flows to which downstream senior water users are entitled? If the Mt. Emmons project will increase the consumptive use of irrigation rights, it will injure downstream seniors. Of course, it is these very questions that AMAX will be required to answer by the water courts when it submits change of water rights applications. The only mitigation measures for the increased consumptive use by the mine and mill were as follows:

Obtain mill makeup water from large flow sources during spring runoff periods, if possible. Divert water during other periods when water is physically legally available. Recycle treated water for reuse. Intercept surface flows above, direct around, and discharge downstream of tailing pond. (p. 276)

Summary

The EIS needs to show the data on AMAX's water rights holdings, such as priority dates, amounts, locations and historic consumptive use. A water use plan describing rates, points of diversions and depletions to the individual streams is also warranted. The effect of water use on supply, the environment and water users should be quantified. The general statements on water use found in the draft EIS are grossly inadequate.

PB:CS

2

See Response 12-1

12-2

12-3

The information in the EIS is adequate for the purpose of environmental analysis. For the purpose of protecting the vested interests of other water rights, more information may be needed. As stated on DEIS p. 110: "In all cases, Colorado's system of water rights adjudication will be followed in order to protect the rights of other users."

3

RICHARD D. LAMM
Governor



JERIS A. DANIELSON
State Engineer

OFFICE OF THE STATE ENGINEER
DIVISION OF WATER RESOURCES

1313 Sherman Street-Room 818
Denver, Colorado 80203
(303) 866-3531

March 5, 1982

MEMORANDUM

TO: Steve Ellis, State Clearinghouse
FROM: Hal D. Simpson, P.E., Assistant State Engineer
SUBJECT: Mount Emmons Mining Project - Draft Environmental Impact Statement.

We have reviewed the above referenced report and have the following comments:

1. The report does not adequately address the impacts of the proposed operation upon the hydrologic balance and existing water rights. The report should discuss the impact on existing water rights when they intercept ground water during mining and put it to use within the mine. The beneficial use of the tributary ground water which includes mine water or gravel pit water which is used for mining or dust control purposes requires a well permit. Since the project is located in an over-appropriated river basin the operation of these tributary wells would require an augmentation plan.
2. The effect of the proposed operation on minimum stream flows was not addressed.
3. There appears to be some conflict concerning what will happen to flood discharges in that vicinity of the tailing pond. On page 329, it is stated that a flood by-pass system capable of handling the 100 year flood is constructed around the tailing pond. It is stated that the system generally discharges into the storage reservoir below the main dam. On Figure C-7, the map shows that the interceptor canal goes around both the pond and the mill-make-up water reservoir. There is not any indication that the canal would discharge into this reservoir. It is not clear how normal flows would be separated from flood flows if the canal does discharge flood waters into the storage reservoir.

13-1

See Responses 12-1 and 12-3.

13-2

These discussions are on DEIS pp. 153-154, 176, 188, and 250.

13-3

The interceptor pipeline is planned for flexibility. It can either discharge into the mill make-up reservoir (Water Division No. 4, Case No. 80OW465), or discharge to Alkali Creek below the reservoir.

LETTER 13 (continued)

FOREST SERVICE RESPONSES

Steve Ellis
March 5, 1982

Page 2

13-4

4

The correct designation for this table is B-5.

4. Table B-S states that the water supply for the Town of Crested Butte will be relocated to the Slate River and the water supply will be improved by constructing a well system. The Town currently gets water from Coal Creek, however, the AMAX proposal would increase suspended sediment in the creek which would tax the already-strained treatment facility. The change in location and method of obtaining water would require a water court decree. The diversion of water at this new location would retain its existing priority. Any expansion of the system may require a new decree with a junior priority. Since Coal Creek and the Slate River are considered over-appropriated, a plan for augmentation would be required if any water would be diverted out of priority.

5. The sand and gravel extraction mentioned on pages 248 and 249 would require well permits prior to any removal of materials if the project will result in any reclaimed lakes that are put to beneficial use as described in the report. Since the project is located in an over-appropriated basin, a plan for augmentation would be required to replace evaporation from the reclaimed lakes.

6. It is not clear whether the Alkali Creek Make-Up Water Reservoir, the Elk Creek Reservoir, or the Tailing Dam will be storing runoff from the drainage areas located upstream of them or whether they will store any other tributary water such as seep water occurring within the mine. However, if they are, they must be able to release this water if it is stored out of priority or they must develop a plan for augmentation to mitigate for storing this water and putting it to subsequent use.

13-5

This information is in Water Division No. 4 Case Nos. 800W462, 800W463, 800W464, and 800W465. Final details and requirements will not be known until the cases have been adjudicated.

5

HDS/RLS:pr

cc: Ralph Kelling, Div. Eng.

STATE OF COLORADO

COLORADO NATURAL AREAS PROGRAM

Department of Natural Resources
1315 Sherman Street, Room 718
Denver, Colorado 80203

Phone (303) 839-3311



Richard D. Lamm
Governor
D. Monte Pascoe
Executive Director
Carol J. Pastmiller, Ph.D.
Program Director

March 15, 1982

Jimmy R. Wilkins
Forest Supervisor
Grand Mesa, Uncompahgre and
Gunnison National Forests
1063 Main Street
Delta, CO 81486

Dear Mr. Wilkins:

We appreciate the opportunity to comment on the Mount Emmons Mining Project Draft EIS.

The Colorado Natural Areas Program is particularly interested in the identification, evaluation and protection of elements of natural diversity of statewide significance which will, or may, be adversely effected by this proposed mining project.

Species of Plants and Animals of Special Biological Concern in Colorado which may be affected by the project are:

Drosera rotundifolia, Gila pentstemonoides, Aquilegia barnebyi and Microsorax hoyi (the pygmy shrew).

Ecosystems of Special Biological Concern occurring in the project site are:

Festuca arizonica (montane grassland) and Festuca thurberi (sub-alpine grassland).

Information on Gila pentstemonoides, Aquilegia barnebyi, Festuca arizonica and Festuca thurberi is contained on the attached statements from Scott Peterson and William Baker (botanists in the Program's Natural Heritage Inventory).

The pygmy shrew (Microsorax hoyi) is one of the rarest mammals in North America. Three of the five known collection sites of this species in Colorado are located adjacent to the study area. This information was not included in the DEIS.

The Mount Emmons Iron Bog is a site on the Natural Areas Registry. The information on pages 49-50 about the bog and the Colorado Natural Areas Program is accurate. The information on page 102 discusses potential impacts on, and mitigation for, the Mount Emmons Iron Bog and its rare inhabitant, Drosera rotundifolia, the Round-leaved sundew.

14-1

During the preparation of the DEIS, documents supplied by Rocky Mountain Biological Laboratory were reviewed (RMEL, 1976). These documents identify biologically significant areas in Gunnison County and include the pygmy shrew. Since all collections of the pygmy shrew were made within 3 miles of Gothic, it was determined that the Mt. Emmons Project would have no effect on the known populations of this mammal. Many species that will not be affected by the Mt. Emmons Project and that were not identified during scoping, were not listed in the DEIS.

LETTER 14 (continued)

Jimmy R. Wilkins
March 15, 1982

page 2

It is my understanding that mining operations will affect the bog by lowering the water table sufficiently to stop the flow of water through the fault system to the springs above the bog. Water would no longer flow through these springs and the bog would dry up and no longer provide adequate habitat for the sundew, or for the other rare species found here such as Leucorhinea hudsonica (White-faced skimmer).

The statement on page 102 that: "The survival of the sundew plant or other bog organisms could depend on narrow ranges of water temperature or trace mineral conditions that could be difficult to determine and duplicate..." in mitigation efforts, is an essential and accurate point. This issue must be seriously considered in the management plan which AMAX intends to develop in cooperation with the U.S. Forest Service and the Rocky Mountain Biological Laboratory. Although Appendix A of the DEIS contains a statement about AMAX's mitigation plans for the bog (page 279, 7.2.2.1), it only mentions management of water flow and water quality into the bog area. Mitigation and management plans for the bog must also include adequate temperature and trace mineral conditions of the water feeding the bog area.

As mentioned on page 102, temperature and trace mineral conditions could be difficult to determine and duplicate. AMAX, RMBL and/or the U.S. Forest Service should perform research prior to, or in conjunction with, the development of the management/mitigation plan for the bog to determine if adequate water conditions can in fact be duplicated. Results of the research may show that mitigation is impossible, and that the only way to maintain this rare ecosystem is to opt for Alternative 1.

The U.S. Forest System lands are public lands managed under land management laws and policies. Land exchanges of these federal lands to AMAX should only be done if AMAX will be required to manage these once-public lands under similar stipulations as the USFS was required to manage them. If this is not possible, perhaps the lands proposed for exchange to AMAX would ultimately fair better if the USFS retained jurisdiction over them and established environmental and administrative controls over AMAX's activities. It is especially important to keep both the Mount Emmons Iron Bog and the Oh-Be-Joyful Wilderness Study Area under public control.

In general, the lands proposed for exchange to AMAX do not appear to be in the public interest in that more, not less, private inholdings within U.S. Forest System lands will result from such exchanges.

If I can be of further assistance please advise.

Sincerely,

Carole Pustmueller

Carole Pustmueller, Ph.D.
Director, Colorado Natural Areas Program

CJP:cas

FOREST SERVICE RESPONSES

14-2

2

The reference to water quality in the mitigation measures assures the qualities of water temperature and trace mineral conditions also.

STATE OF COLORADO

COLORADO NATURAL AREAS PROGRAM
Department of Natural Resources

Natural Heritage Inventory
1550 Lincoln Street, Room 106
Denver, Colorado 80203
Phone (303) 666-5367



Richard D. Lamm
Governor
D. Monte Parks
Executive Director
Carol J. Padmugler, Ph.D.
Program Director

March 2, 1982

Mr. Jimmy R. Wilkins
Forest Supervisor
Grand Mesa, Uncompahgre and Gunnison
National Forests
1063 Main Street
Delta, CO 81416

Dear Mr. Wilkins:

The project site contains two plant communities that are on CNHI's list of Ecosystems of Special Concern in Colorado. These are:

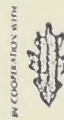
Festuca arizonica montane grassland - this ecosystem is endemic to southern Colorado and northern New Mexico. It has been altered extensively throughout its range by grazing. The occurrence in the project area, described in Stoeker-Keammerer (1980)-stand M-AS-12, appears to be in good condition.

Festuca thurberi subalpine grassland - this ecosystem is found only in western Colorado, Utah and New Mexico. It also has been altered throughout its range by grazing. The occurrence in the project area, described in Stoeker-Keammerer (1980)-stand WAS-M-6, appears to be in excellent condition.

The first ecosystem is among the highest priority in the state at the current time. Good to excellent quality occurrences are of regional significance. The second ecosystem is of slightly lower significance, but this is one of the few occurrences in excellent condition we currently have data for.

We would encourage consideration of these important ecosystems during the planning process. If I can be of assistance, please contact me.

Cordially,
William L. Baker
William L. Baker
Plant Ecologist



14-3

The Forest Service has met its responsibility in protecting threatened and endangered species. The species identified in this comment are not in that category.

LETTER 14 (continued)

STATE OF COLORADO

COLORADO NATURAL AREAS PROGRAM
Department of Natural Resources
Natural Heritage Inventory
1550 Lincoln Street, Room 106
Denver, Colorado 80203
Phone (303) 866-5887



Richard D. Lamm
Governor

D. Monte Pascoe
Executive Director

Carol J. Pasmueller, Ph.D.
Program Director

TO: Jimmy R. Wilkins
FROM: J. Scott Peterson
DATE: March 2, 1982
RE: Mount Emmons Mining Project/Special Plants

pg. 49: The information on the Mt. Emmons Iron Bog regarding D. rotundifolia is accurate and complete.

pg. 50: Gila pentstemonoides - A USFWS Category 2 species has been recommended by the Inventory for Category 3C status to the Service and as a Sensitive Species to other federal agencies. A status report is on file at the Region 6 Service office. This taxon is currently being studied by W. Grey at the University of Northern Colorado.

Aquilegia barnebyi - A USFWS Category 2 species has been recommended by the Inventory for Category 3C status to the Service and as a Sensitive Species to other federal agencies.

pgs. 103-105: Plant discussions are accurate and complete for this document.

IN COOPERATION WITH



LETTER 15



COLORADO DEPARTMENT OF HEALTH

Frank A. Traylor, M.D.
Executive Director

Richard D. Lamm
Governor

March 5, 1982

Mr. Adam Poe, Program Director
Colorado Joint Review Process
Department of Natural Resources
1313 Sherman Street
Denver, Colorado 80203

Dear Adam:

In response to your memo of January 21, 1982, we have reviewed the Mt. Emons Draft Environmental Impact Statement. We feel that the following comments are appropriate.

Water Quality Control Division

1. The Draft EIS states that AMAX is looking at options for control of water after operations are complete. An alternative must be selected which will assure that no deterioration of surface or groundwater occurs after mining and milling operations cease.
2. The Draft EIS makes reference to AMAX's Environmental Report (1981). The Environmental Report indicates that groundwater monitoring systems will be situated at various points below the tailing disposal area to allow detection of any seepage which may occur. The Draft EIS states that groundwater contamination is unlikely because of geological conditions in the area. Mancos shale is not always homogeneous. Since lenses and fractures may occur throughout the formation, we feel that seepage is still a possibility. The report does not discuss what measures will be used to mitigate groundwater contamination if it should occur.
3. The Draft EIS does not address the specifics of the milling operation; however, the AMAX Environmental Report does explain the milling process which will be used at the Mt. Emons operation. Can the process which is utilized at the Climax operation for separation of the pyrite ore be employed at the Mt. Emons operation? Has this option been considered? An alternative should be evaluated in which pyrite is separated from the other tailings and disposed of in a lined tailings pond.
4. Potentially toxic materials may spill onto roadway surfaces during hauling operations and migrate to groundwater or possibly surface water during snowmelt periods. No procedures to prevent or mitigate

FOREST SERVICE RESPONSES

15-1

Seepage is possible but not probable. Mitigation measures required for activities on NFS lands will be specified in the Forest Service Record of Decision. See Response 2-5 and FEIS p. 12.

15-2

Pyrite is separated at Climax only as a step in the tungsten recovery circuit. The separated pyrite is discharged to the tailing disposal area with the rest of the tailing. A tungsten recovery circuit is not envisioned for the Mt. Emons Project.

Since Alkali Basin is underlain by Mancos Shale, it essentially has a natural lining.

15-3

The details of an emergency spill plan required by the Forest Service will be specified in the Forest Service Record of Decision.

LETTER 15 (continued)

FOREST SERVICE RESPONSES

Mr. Adam Poe
March 5, 1982
Page 2

this potential problem were identified in the Draft EIS. This should be addressed in the Final EIS.

5. The proposed culvert on Coal Creek could significantly increase the velocity of the stream, creating a major scouring effect downstream. The design and construction of culverts must be such that this problem does not arise.
6. The Division is concerned that lead levels in Crested Butte's water supply possibly will and may even already exceed Federal drinking water standards. The mitigation measures identified in the Draft EIS should alleviate the problem.

Air Pollution Control Division

The APCD is satisfied that air quality permits contain conditions necessary to mitigate direct air pollution impacts. However, we are concerned about the mitigating measures proposed for the associated secondary emissions from the increased population. Page 275 indicates that air quality computer programs, land use planning regulations, and possibly air emission regulations will mitigate these secondary impacts. Yet there is no evidence that resources are available at either the local or state level to carry out the necessary modeling, monitoring, and analysis suggested in the Draft EIS. We recommend that the EIS either state that secondary impacts will not be mitigated, or have the EIS demonstrate that the county has access to and uses air quality data as criteria for decision making in land use planning.

Waste Management Division

The Mt. Emmons project must comply with all Department of Health solid and hazardous waste rules and regulations. The Mined Land Reclamation Board is responsible for overseeing compliance with these regulations.

Our noise expert has been unavailable for the last couple of weeks. When he gets in next week we will have him review the Draft EIS. If he should have any comments, we will forward them to you.

Should you have any questions on these comments, please do not hesitate to contact either Paul Nazaryk or myself.

Sincerely,

Tom Looby

Thomas P. Looby
Environmental Programs Administrator
Office of Health Protection

TPL:ts

LETTER 16

FOREST SERVICE RESPONSES



COLORADO STATE DEPARTMENT OF HIGHWAYS

March 5, 1982

Mr. Adam Poe
Program Director
Joint Review Process
Department of Natural Resources
1313 Sherman Street, Room 723
Denver, Colorado 80203

Dear Mr. Poe:

The Colorado Department of Highways has completed its review of the Draft Environmental Impact Statement for the Mount Emmons Project and has the following comments.

Two of the major concerns of the Department are the reduction of level of service on SH 135 caused by increased traffic volumes and the accelerated surface deterioration of SH 135 caused by heavy truck traffic. The mitigation measures outlined on pages 284 and 318, including the staggering of work hours, emphasizing the use of bus-van pooling for mine workers, reducing on-site employee parking, and the improvement of SH 135 through upgrading will reduce many of the worker/work trip problems associated with the proposed project.

However, we are also concerned that the mixing of large trucks associated with mine/mill activity and passenger vehicles, particularly tourists unfamiliar with the area or Amax's operations, could result in a significantly dangerous situation. Information in the document indicates that truck traffic related to construction and operation of the mine and mill will result in a substantial increase in accidents. We feel that the vehicular mismatch (trucks/cars) on SH 135 will result in an increase in injuries and fatalities. To help mitigate and minimize the severity of this potential problem, improvements to SH 135, including a truck climbing lane, will be necessary.

We suggest that the project approval process by the Forest Service and Gunnison County be conditioned or stipulated to include the transportation impact mitigation measures as listed on pages 284 and 318 of the Draft EIS. This would insure that the proposed mitigation plans for transportation as well as many other problem

16-1

Improvements to Colorado 135 are listed as mitigation measure on DEIS p. 318.

1

MAR 09 1982

LETTER 16 (continued)

Mr. Adam Poe
March 5, 1982
Page 2

areas resulting from the project would become a reality as the project is developed.

Thank you for the opportunity to provide comments on this document, and we look forward to reviewing the Final EIS.

Very truly yours,

Harvey R. Atchison
Director
Division of Transportation Planning

By *Barbara L.S. Chocoi*
Barbara L.S. Chocoi
Manager
Impact Evaluation Branch

REG/rg

STATE OF COLORADO

DEPARTMENT OF AGRICULTURE

1525 Sherman Street
Denver, Colorado 80203
(303) 839-2811

MEMORANDUM
82-65

DATE: March 5, 1982

TO: Steve Ellis, State Clearinghouse

FROM: Jim Rabin, Colorado Department of Agriculture

SUBJECT: MOUNT EMMONS DRAFT EIS

The Colorado Department of Agriculture would like to make the following comments concerning the Mount Emmons Draft EIS.

1. Loss of Agricultural Water. The Draft EIS states on page 110 and 128 that senior water rights have been acquired and that some water will be shifted from agriculture to mining. Some estimate or range should be given in order to quantify this impact on agriculture in the region.
2. Labor. The Draft EIS fails to describe how this project may impact the agricultural labor force. Since the mining industry can afford to pay higher wages than can agriculture, it often becomes more difficult for agricultural producers to procure the necessary labor. This can have a direct impact on the producers' willingness to keep their land in agricultural production.

3. Agricultural Land Values. The Draft EIS states that up to 1200 acres of agricultural land may be purchased for urban purposes. How will this impact land values? Will it raise land values to a point where they can no longer be purchased for agricultural production?

4. Long Term Impacts. The long term effects of this project on the entire agricultural sector in the impacted region should be evaluated in this section (page 252) as well as the impacts to grazing.

5. Mitigation. Techniques for mitigating the impacts to the agricultural labor force (3 above) should be discussed in the mitigation section. Possible mitigation procedures include providing "ranch leave" during harvest or calving periods or job sharing where two individuals could work half time on the ranch and half time at the mine thus providing the mine with one full time employee and also allow these individuals to pursue agricultural careers. If such mitigation measures were possible, it would likely have a positive impact on the agricultural sector in this region.



DIVISION OF LOCAL GOVERNMENT

Richard O. Lamm,
Governor

Morgan Smith,
Commissioner

Donald Swedman,
Deputy Commissioner

Agricultural Commission
Henry Christensen,
Roggen

Ben Eastman,
Hotchkiss

John Malloy,
Denver

Elliott Miller,
Fort Lupton

Don Moschetti,
Center

William Stephens,
Gypsum

William Webster,
Greeley

Clide Widener,
Granada

Kenneth Wilmore,
Denver

17-1

This has been added. See FEIS p. 8.

17-2

FWML (1980b) and Snider (1981) discuss a modest historical contraction in the agricultural sector in Gunnison County, and Snider (1981) predicts no significant impact of the Mt. Emmons Project on this trend. This is because most of the operations are owner-operated and do not rely heavily on hired labor.

17-3

This pattern can be expected.

17-4

Records show 1975 was the last year that any crop other than hay was planted in Gunnison County (Snider, 1981). Livestock production is the focus of the agricultural sector in Gunnison County. Therefore, the discussions in the DEIS are adequate.

17-5

See Response 17-2.

STATE OF COLORADO

Department of Local Affairs

DIVISION OF LOCAL GOVERNMENT

Karen Reinertson, Director



Richard D. Lamm
Governor

M E M O R A N D U M

TO: Steve Ellis, State Clearinghouse
FROM: Reid T. Reynolds, State Demographer *[Signature]*
RE: Comments on Socioeconomic Impact Contained in Mount Emmons
Mining Project Draft EIS
DATE: March 10, 1982

After reviewing the socioeconomic projections contained in the Mount Emmons Mining Project draft Environmental Impact Statement and the associated projection methodology, input data and assumptions contained in the Social and Economic Studies Workbook, I have the following comments.

My first impressions are that BMML appears to have done a reasonably detailed analysis of the socioeconomic scenarios for Gunnison County both with and without the Mount Emmons Project. Projected population impacts associated with the project appear to be in the general range of what one would expect with such a project. However, I think we should reserve the right to submit an updated assessment of the projected impacts in the near future as we acquire additional census results and economic data for Gunnison County and as we develop our economic-demographic modeling capability.

RTR/bp

RICHARD D. LAUM
Governor
ROBERT J. OBE
Executive Director
R. L. WHITFIELD
Director



DEPARTMENT OF LABOR AND EMPLOYMENT

OFFICE OF MANPOWER PLANNING AND DEVELOPMENT

70 GRANT STREET - SUITE 222
DENVER, COLORADO 80203
19-3165

MEMORANDUM

TO: Adam Poe, Program Director
Joint Review Process

FROM: Ben Whitfield, Director
Office of Manpower Planning and Development

RE: Review of Mount Emmons EIS

DATE: March 8, 1982

The Department of Labor and Employment has reviewed the Mt. Emmons Draft EIS and feels it is fairly comprehensive in terms of those particular mitigation strategies addressed. However, discussion surrounding labor issues must be expanded substantially. The Department of Labor and Employment would like the following labor-related concerns included in the final EIS.

1. The EIS should include projected labor requirements by major categories for construction and for operation.
 2. The EIS should include strategies to address rising wage levels and resulting impacts on availability of labor for agriculture, public sector employment, and other sectors of the economy with moderate wages.
 3. The EIS should include secondary impact worker projections and related housing plans as well as mitigation strategies to accommodate the secondary workforce.
 4. While AMAX identifies a need for importing labor, they do not address strategies for training local residents. Such strategies would lessen the need for in-migration of workers. It is critical that such training plans be developed, and in fact, lack of a plan fails to address the Governor's "Jobs for Coloradans" policy.
 5. While AMAX discusses encouraging local employment through post high school and college recruitment, they should also address recruitment strategies of the local unemployed population.
- The Department of Labor and Employment feels the above labor issues should be covered in the final Mt. Emmons EIS. If you have any questions regarding these comments, please feel free to contact me.

pkc

LETTER 20

STATE OF COLORADO

THE PUBLIC UTILITIES COMMISSION
Department of Regulatory Agencies
500 State Services Building
1525 Sherman Street
Denver, Colorado 80203



Richard D. Lamm,
Governor

Wellington E. Webb,
Executive Director

COMMISSIONERS:
Edythe S. Miller,
Chairwoman

Daniel E. Mays,
L. Duane Woodard

Harry A. Galligan, Jr.,
Executive Secretary

Administration (303) 866-3154
Transportation (303) 866-3171
Fixed Utilities (303) 866-3181
Counsel (303) 866-3186

March 10, 1982

Mr. Adam Poe
Department of Natural Resources
723 State Centennial Building
1313 Sherman Street
Denver, CO 80203

RE: Major Action Draft
EIS #79-126

Dear Mr. Poe:

This letter is to convey the comments of the Colorado Public Utilities Commission on the draft Environmental Impact Statement for the Mount Emons Mining Project.

The concerns of this Commission center on the two issues of the financing of whatever facilities must be built by Gunnison County Electric Association to serve the Mount Emons Project and the impact of this Project on the generation requirements of the Colorado-Ute Electric Association. We would plan to address the first of these concerns in the application to be filed by Gunnison County Electric Association for a Certificate of Public Convenience and Necessity to build the required facilities. The second issue will be addressed in a separate proceeding before the Commission.

If you would like any additional information, please do not hesitate to contact me.

Very truly yours,

Harry A. Galligan, Jr.
HARRY A. GALLIGAN, JR.
Executive Secretary

HAG:dc

MEMORANDUM

OFFICE OF ENERGY CONSERVATION
1525 Second Street, Suite 100
Denver, Colorado 80202
Phone (303) 866-2507, 866-2186



DATE March 5, 1982

TO Adam Poe

FROM David L. Ford *David L. Ford*

SUBJECT Mt. Emmons DEIS #79-126

The Colorado Office of Energy Conservation has reviewed the Mt. Emmons Draft Environmental Impact Statement and has the following comments to offer.

Overall, the attention to and adequacy of the energy analysis in the DEIS is to be commended. Primary and secondary energy impacts have been considered and documented. The following elements of the DEIS energy analysis were very helpful in determining the project's energy impacts: total primary and secondary energy consumption requirements; power supply (source and demand projections); worker access and transportation energy consumption; and energy consumption comparisons of the various aspects of the project operation.

Since electrical energy accounts for over 80% of the project's total primary energy needs and the DEIS acknowledges that "power supply inadequacies are possible during the life of the project" (DEIS, p. 34), the DEIS should address in more detail the capability of Gunnison County Electric Association, and ultimately, Colorado-Ute, to build and supply or purchase from available power grids the necessary power requirements of the project (55 Mw) plus the secondary community electrical power requirements. However, no specific demand figure is given for the secondary power requirements.

Energy construction requirements were not defined for the project because it was assumed that there would not be a significant difference between the alternatives. That assumption is acceptable. However, the question which is not answered is: How does the magnitude of the construction energy requirements compare to a full production annual operating energy consumption requirements? Is it significant?

Assuming that enough additional electrical generating capacity is built for Colorado-Ute and GCEA, another concern is the amount of electrical rate increases attributable to the project which will be passed along to all consumers. The DEIS is correct in stating that "management strategies are available to offset this potential cost to local consumers." (DEIS, p. 107). Whether this happens remains to be seen. It could and should be included as a mitigation measure.

21-1

The nature of the power supply inadequacies, as well as four optional means of resolving the inadequacies are discussed on DEIS pp. 220-221. It should be understood that GCEA is regulated by the Colorado Public Utilities Commission who has designated GCEA a certificated service area. Under this regulation GCEA is required by law to provide power to any customer requesting service. Given the above, the discussions in the DEIS are considered adequate to make a reasoned choice among alternatives.

LETTER 21 (continued)

FOREST SERVICE RESPONSES

MEMO: Adam Poe
March 5, 1982
Page Two

It is reassuring for the DEIS to point out that a bussing and carpooling worker transportation alternative can achieve a reduction of 68 to 76% in energy consumption over the individual vehicle mode, which assumes a 1.5 to 2.0 average vehicle occupancy (this is much higher than the average Denver metro area commuter vehicle occupancy rate of 1.2).

The remainder of my comments relate to the mitigation measures which could be used to reduce "normal" or "expected" increases in energy consumption. Most of these suggestions can be incorporated into Table B-4 in Appendix B, DEIS, P. 310. First I would change the title of the table to read "Energy Consumption and Demand Mitigation Measures." The "impact" should then be "Increases in Local energy consumption and demand." The first mitigation measure should be expanded to say: "Incorporate energy conserving requirements and solar and renewable energy incentives into local building codes, development review, and approval processes. "Vanpooling" should be inserted as another viable option in the second mitigation measure. Another mitigation measure should be added stating that a community energy management planning process and community awareness program should be initiated to achieve energy as well as cost savings for the community.

Thank you for the opportunity to participate in the review of this document and all of those preceding this one. If you have any questions, please do not hesitate to call.

DLF/jb1

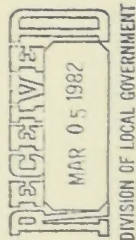


COLORADO
HISTORICAL
SOCIETY

The Colorado Heritage Center 1300 Broadway Denver, Colorado 80203

February 26, 1982

Mr. Stephen O. Ellis
Principal Planner
A-95 Clearinghouse
420 State Centennial Building
1313 Sherman Street
Denver, Colorado 80203



RE: Draft Mount Emmons Mining Project Environmental Impact
Statement (EIS), #79-126

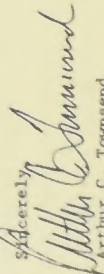
Dear Mr. Ellis:

This office has been in contact with the Gunnison National Forest archaeologist, Polly Hammer, concerning the above project. There were discrepancies between the numbers and types of sites listed on page 113 in the EIS and with those on file in this office. These have been discussed with the Forest Service (FS) and the differences resolved.

The FS has made determinations of eligibility on 664 sites in consultation with this office. Determinations of effect will be made in the future on those resources determined eligible, again in consultation with this office.

The areas that will be directly impacted in the present plans for the project have been 100% surveyed for cultural resources (personal communication, Polly Hammer). Other project areas have been only partially surveyed. The FS has stated that as the project develops all areas to be impacted will be 100% surveyed to identify eligible properties.

We look forward to continued consultation with the Forest Service on this project. If this office can be of further assistance, please contact the Compliance Division at 866-3392.

Sincerely,

Arthur C. Townsend
State Historic Preservation Officer

ACT/HJC:ss

22-1

These corrections have been made. See FEIS p. 9.

LOCAL GOVERNMENT COMMENTS

Letter 23: Gunnison County 91
Letter 24: Gunnison County 102
Letter 25: City of Gunnison. 103
Letter 26: Town of Crested Butte 108

Gunnison County, Colorado

Board of
COUNTY COMMISSIONERS

GUNNISON, COLORADO

March 12, 1982

Mr. Jimmy Wilkins
U.S. Forest Service
Delta, Co. 81416

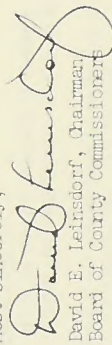
Dear Mr. Wilkins:

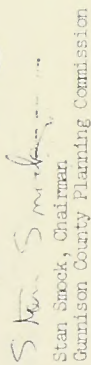
Following are comments of the Board of County Commissioners and County Planning Commission regarding the Draft Environmental Impact Statement on the Mt. Emmons Mine Project. We appreciate both the opportunity to respond to this statement, and the effort of cooperative and open planning which preceded it.

The cooperation among the agencies, which was fostered by the Colorado Joint Review Process, represents an improved and innovative approach to the E.I.S. process, and is one which should be perpetuated. The Forest Service's inclusion of a bracketed range of production and site alternatives encompasses many of the issues expressed as part of the process.

We would be happy to meet with you or your I.D. team representatives, at any time convenient to you to discuss these comments in particular and the D.E.I.S. in general. Again, thank you for the opportunity to participate in this review.

Most sincerely,


David E. Leinsdorf, Chairman
Board of County Commissioners


Stan Smock, Chairman
Gunnison County Planning Commission

RESPONSE FROM GUNNISON COUNTY
ON MT. EMMONS D.E.I.S.

Following are comments of the Board County Commissioners and County Planning Commission regarding the Draft Environmental Impact Statement on the Mt. Emmons Mine Project. We appreciate both the opportunity to respond to this Statement, and the effort of cooperative and open planning which preceded it.

The language in the draft is unclear as to the methodology and supportive data which contributed to the Forest Service's formulation and analysis of the seven, and, ultimately, of the Preferred Alternative. Information found in source documents in some instances is in conflict with language expressed in the Statement. Assumptions without analytic structure require tedious background research and do not adequately inform either the Forest Service or the County decision makers.

Given the information presented in the Statement, the choice of one alternative over another is insupportable. There is no a priori basis for selection of the six alternatives; unfortunately, this means that only the AMAX alternative represents a viable and well conceptualized plan.

The D.E.I.S. summarizes 40,000 pages of the proponent's proposals and justifications, research and comments by the proponent's consultants, and the U.S. Forest Service's synthesis of all this information. This is a mass of information based on other work; the result is a document the decision makers can ignore or use and is of little value to Board and Commission members who have followed and studied the earlier source documents.

We cite the following examples:

Page 217: "Project will bring about stable employment." This is an example of a generalization that is neither supported by the facts, nor qualified so as to be acceptable. The beneficial social and economic benefits (more and better jobs, a larger county payroll and at least 30 years of steady employment) have been thoroughly emphasized by AMAX, Briscoe, Murray, Mopis and Laont, and the Forest Service. This information is, of course, correct, or at least partially correct. All these benefits will accrue if:

1. Molybdenum prices stay high
2. There is no national depression
3. AMAX can operate (or build) a molybdenum mine at a profit.

Fig. 2: "Construction of facilities at Mount Tolson...has been terminated. The decline in molybdenum consumption--with the resulting buildup in producer inventories and price reductions--that has come out of the prolonged worldwide recession was a major contributing factor in the decision to curtail activities. The Company also announced reductions in manpower and production at its western operations beginning in January, 1982. Production from the two Colorado molybdenum mines will be reduced approximately 25 to 30 percent with a reduction of 800 to 900 employees in the mines and offices through retirements, layoffs and in some instances, terminations."

The point is, although a mining company can offer employment, and perhaps steady employment, the ups and downs of the business and mining cycles can seriously affect employment and the local economic picture. If Gunnison County had become indebted, or should do so in the future to increase its infrastructure to handle this AMAX impact based on the assumption that AMAX is a steady employer and business operator, it would have and will involve a major risk.

I

This has been clarified. See FEIS pp. 17-18.

LETTER 23 (continued)

FOREST SERVICE RESPONSES

MEED:

During the scoping process the question arose, "Does the need for molybdenum justify the project?" (Issue #18, Appendix H). The D.E.I.S. essentially ignores this issue. Reference is made to the Mining Laws (p. 377) in which a short discussion perhaps suggests that need is not a factor in the decision process. Reference is also made to uses of molybdenum (p. 6) where a short list of uses is given. Not referenced is a discussion of benefits on page 107. While all of these references may be true, they do not answer the question.

Worldwide molybdenum production capacity has recently increased dramatically while consumption is down. The January, 1981 issue of the "Engineering and Mining Journal" on page 73 lists five new mines or mine expansions with start up dates between 1981 and 1983. Three of these mines (at Kitsonville, B.C.; Thompson Creek, Id., and Kye County, Ky.) will total about 37 million pounds per year of new molybdenum production capacity, while the other two mines (at Ross Min., B.C.; and Questa, N.M.) will total 19 thousand tons of ore production per day. While no ore grade is given for these last two mines, a typical ore grade of .18% and 80% recovery would produce about 13 million pounds per year of molybdenum. This 50 million pounds per year increased capacity should be compared with an estimated total world production of 238 million pounds in 1980 as reported in the 1980 Bureau of Mines Mineral Yearbook and with the proposed production of 30 million pounds per year from Mt. Emmons.

Development of these new mines was initiated in response to the economic situation in the past decade. As recently as 1980 (Bureau of Mines Bulletin 671), a market growth of 4.5% per year was projected leading to a world demand of 610 million pounds in the year 2,000. Today all this has changed.

AMAX has cut employment of Colorado molybdenum miners by a third. Market projections based on trends of the past decade have questionable value. As we slide deeper into recession, no one can predict when this new trend will change. The world economy, including the United States, is experiencing an ever increasing need for investment capital to replace aging equipment and facilities and to provide for growing populations. Meanwhile, falling productivity is shrinking the productive surplus that is the source for the needed capital. The resulting capital shortage combined with project obsolescence may well lead to drastically reduced economic growth as we spend a generation rebuilding our public and private infrastructure.

The immediate result is that molybdenum consumption has been falling for two years, and this can be attributed only partially to the cyclic minerals market. Molybdenum prices now are strongly affected by the availability of molybdenum byproduct from copper mining that can be produced at costs far lower than can be achieved in a primary molybdenum mine such as that at Mt. Emmons. (See testimony by Clifton Molybdenum at the Colorado State Severance tax hearings, February, 1982.) Almost 50% of free world molybdenum production is now byproduct, and this fraction will probably increase as more copper ore with high molybdenum content is produced from new mines in Central and South America. Vanadium, a low cost byproduct from several mining processes, can substitute in many applications; and this will further tend to keep a lid on molybdenum prices. Molybdenum is not the glamour metal it was even a decade ago.

AMAX has recognized these economic realities and shelved the Mt. Emmons project indefinitely. (It has also withdrawn from its Mt. Tolson Project.) Appendix G of the D.E.I.S. wisely displays the Mt. Emmons schedule as Year 1, Year 11, etc., but errs in identifying 1984 as Year 1. AMAX officials have not said they will start in 1984; they have said they will NOT start before 1984.

This is quite different.

AMAX has no intention of investing a billion or more dollars until the economic situation becomes more clear and molybdenum prices rise to a level to make Mt. Emmons profitable. That may be never. With falling stock prices and restless stockholders, AMAX will be looking for the best investments it can find. (It should be noted that byproduct recovery of precious and base metals could significantly affect the economics of the Mt. Emmons Project, but this is not addressed in the D.E.I.S.)

23-2

The evaluation of need for a product such as molybdenite is largely left to the private sector. This evaluation is based partly on the projected supply-demand picture, and partly on the price-competitiveness of the product in the marketplace. Thus, even though the current oversupply of molybdenum may continue for several years or more, AMAX might still seek to develop the Mt. Emmons Project if it feels it can compete successfully with other suppliers of molybdenum.

23-3

A newly revised Plan of Operations (AMAX, 1982) indicates that year 1 is 1984, but other indications from AMAX suggest that the startup date is somewhat uncertain.

"Business Week" for January 11, 1982, on page 95, states, "The most troubled metal in 1982 will be molybdenum, which may see no real recovery until the mid-1980's. High molybdenum prices in the late 1970's, caused in part by shortages, triggered gross overexpansion that will take years for the U.S. market to soak up."

METHODLOGY:

Let us consider what the D.E.I.S. is and what it is not.

Behind the D.E.I.S. is a library of more than 40,000 pages of specialized studies and other documents relating to baselines, impacts, mitigation strategies, and technological alternatives. This library, if properly used, offers the potential for greatly improving planning and public resource management in Gunnison County for many years to come; and this is a major public benefit of the E.I.S. process.

Built on this massive library is an analysis that the D.E.I.S. documents. The analysis process was conducted by the Forest Service and was designed primarily to meet the needs of Forest Service decision-makers. These Forest Service decision makers have a relatively narrow view of their authority with respect to proposed mining operation. Under these limitations, only a narrow analysis is necessary to develop the information needed by the decision makers; and, since the D.E.I.S. has been reviewed by these authorities, we can assume that their needs are met in the present document.

Beyond its contribution to the decision process, the D.E.I.S. must also satisfy the legal requirements of the National Environmental Policy Act (NEPA) and the regulations of the Council of Environmental Quality (CEQ). These requirements account for most of the bulk of the D.E.I.S. in which public concerns and issues, alternatives, and impacts are addressed. Since most of these matters lie outside the perceived authority of the Forest Service decision makers, it is not surprising that the D.E.I.S. is structured around legal requirements rather than around substantive issues concerning the Mt. Evans Project itself. Again, since the D.E.I.S. has passed Forest Service review, we can assume that the Forest Service decision makers believe it satisfies the letter of law and regulation and thus meets their needs.

More was expected, however.

Under the Joint Review Process, the Forest Service agreed to conduct a thorough analysis useful to all parties and unhindered by the limitations of authority of any one agency. The D.E.I.S. fails to reflect such an analysis. Although the D.E.I.S. addresses at least 17 impact categories (including wildlife, water, energy, air, noise, socioeconomic, etc.) under seven major alternatives, little insight is provided concerning assumptions, methodology, or the significance of the displayed analysis results. Key measures are left undefined, and strong conclusions are presented without supporting arguments or references. The D.E.I.S. is the only public record of the Forest Service's long analysis and it should stand alone, at least at a qualitative level.

It is not enough that all of the basic information is available in the 40,000 page library. The purpose of analysis is to condense vast amounts of raw information into a comprehensible format, applicable to a particular situation. This condensation brings the skills of many technical specialists to bear in order to simplify the job of the decision maker who is thus spared the time and effort of personally absorbing the library. It further allows any interested reader to understand the considerations entering into whatever decision is reached. Without this level of clarity, the D.E.I.S. perhaps meets the letter of law and regulation, but certainly not the spirit nor the needs of other participants in the Joint Review Process.

Neither of the principal CJRP implementing documents--the Joint Statement and the Statement of Responsibilities--contain any such agreement referenced in this comment. The Forest Service has committed considerable time and effort to CJRP and has fully met its obligations and responsibilities as described in the above referenced documents.

LETTER 23 (continued)

FOREST SERVICE RESPONSES

ENERGY/POWER SUPPLY:

Regulations of the Council on Environmental Quality (CEQ) require an analysis of "Energy requirements and conservation potential of various alternatives and mitigation measures." Relevant issues from Appendix H include:
 Issue 4: What will be the impacts of using local source materials (coal, gravel, etc.) in the proposed project?

Issue 5: What methods and routes should be used for transporting personnel and support services to the project's work sites?

Issue 11: What will be the impacts on existing industries and related businesses resulting from the proposed introduction of the mine?

Issue 16: What are the impacts of the total energy requirement of the proposed project, and what conservation measures will be applied to limit these requirements?

Issue 25: Can the ore haulage system be designed and utilized to serve other transportation needs in the county?

Issue 26: How should delivery of electrical power to the mine and mill sites be accomplished?

There are 30 page listings in the index under the headings Coal, Energy, and Power Supply, and a total of 74 pages (more than 15% of the E.I.S.) on which this energy related material is discussed. Energy related issues are important to the CEQ, they are important to the public, and they consume much of the space in the E.I.S., yet the discussion is nearly incomprehensible. Let us examine the energy analysis page by page:

Pages 26 and 27: For Alternative #7, one is hauled by diesel/electric locomotives. Why was the South Portal Substation (needed only for electric locomotives) not eliminated and the power line routed up the East River Valley along the existing power line corridor, thus reducing overall impacts?

Page 30: The chart showing Million BTU/ton of MoS₂ concentrate does not indicate whether this is operating energy, construction energy, or some combination.

Page 34 and 35: This important information is not listed in the index. In Table 2-3, the number of miles of common corridor is listed for the various alternatives, but there is no indication whether this is a good or bad feature. Two power lines in the same corridor, for example, have less environmental impact but more vulnerability to slides, lightning, etc.

Page 39: Use of an East River to Chance Gulch ore haul railway for mass transit and freight cannot easily be compared with major metropolitan areas. The linear arrangement of population centers and work sites provides some distinct advantages over most metropolitan areas. Locating a freight yard at the mill and transferring mine cargo from trucks to trains could reduce many adverse impacts. A life cycle analysis is needed, to include the tradeoff against the cost of upgrading Highway 135. It is not unrealistic to assume that the County could require anything reasonable from AMAX. The whole point of Issue 25 is the cost/benefit assessment to determine what is reasonable.

Pages 40 and 41: This important power supply discussion is not listed in the index. The alternative of on-site power generation is dismissed after reference to AMAX's Environmental Report with the single sentence, "The economic and environmental costs associated with this alternative were considered unacceptable through interdisciplinary analysis by the Forest Service." No reference is made to any documentation of this "interdisciplinary analysis," and the AMAX report does not reach or support the Forest Service conclusion.

The AMAX report does say that "to use the plant effectively, it would have to be operated as the primary power source for the project with the public utility line used as the backup system." The power plant could be located at the mill site to reduce environmental impacts. On-site power generation appears to be the most viable alternative to the Hosenranch Park power line. Since it is not certain that the 345kv line through Poudre will be built, it is only prudent to examine an alternative. Life cycle cost estimates are needed to compare these alternatives.

Page 40: Cogeneration offers a potential for significant energy conservation. If on-site generation is adopted, then waste heat can be used for process and space heating needs of the mill. The reference DOE 1979 states clearly that this arrangement is not subject to the 50,000 pounds per hour steam limitation described in the E.I.S. This alternative should be restudied in compliance with CEQ.

Page 4

See Colorado Office of Energy Conservation comments, Letter 21.

23-5

23-6

A substation at the south portal of the Mt. Axtel tunnel, in addition to powering electric trains, serves to power large pumps which move potable water to both the mine and the mill and would be needed to power the large ventilation fans needed because of the diesel/electric engines in the tunnel. The substation for Alternative 7 may be smaller, but the exact size has not been determined.

An alternative routing the transmission line up the East River Valley was analysed in Alternative 4.

23-7

This has been clarified. See FEIS Appendix I.

23-8

This has been corrected. See FEIS p. xxv. See also Response 23-24.

23-9

The Forest Service declines to reconsider this mass transit alternative.

23-10

This has been corrected. See FEIS p. xxv.

The economic and environmental costs are discussed on DEIS p. 222-223. The Forest Service believes this discussion supports the conclusion that was made, particularly when weighed against the consolidation of somewhat lesser "per Kw" impacts if the necessary generating capacity is combined with a larger commercial power generating plant.

23-11

See FEIS Appendix D for additional information on the 345 kv power source.

The difference between the cogeneration comments in this letter and the cogeneration discussion in the DEIS is one of perspective. These comments would have AMAX construct a 55+ megawatt power generation plant and as a byproduct use the residual heat in its mining operations. The DEIS, however, is considering an application for a mining operation. The residual heat from the proposed operation is not sufficient to generate a significant proportion of the total power requirements. An application to construct a 55 megawatt power plant would be a major project by itself and is not being evaluated in the Mt. Elmons EIS.

LETTER 23 (continued)

FOREST SERVICE RESPONSES

23-12

This has been clarified. See FEIS Appendix I.

Page 94: The E.I.S. states that there is coal in the Crested Butte area. So?

Issue 4 asked about the use of the coal on the Mt. Emmons Project. With 48,000 tons/yr. consumption projected by AMAX and perhaps 150,000 to 200,000 tons/year needed if there is on-site power generation, this is an important question with many economic and environmental implications.

Page 106: Failure to estimate the energy required to construct the mine pad, mill pad, and related facilities means that Alternative 1 cannot receive a fair comparison and that the energy chart on Page 30 can only refer to operating energy.

Page 131: Alternative 1 is not considered.

Page 143: Alternative 1 is not considered.

Page 153: Failure to estimate the energy required for reclamation means that Alternative 1 cannot receive a fair comparison and that the energy chart on page 30 can only refer to operating energy.

Page 195: Table 4-41 displays total energy requirements for electric ore haulage to Chance Gulch, while on Page 194, comparative analysis shows electric ore haulage to be cheaper than diesel-electric to Chance Gulch. Why, then, is the more expensive diesel-electric system selected for inclusion and analysis in Alternative #7? Is this an example of including a "reasonable range" of alternatives for the CED rather than seeking the best configuration for the Mt. Emmons Project?

Page 222: Is this the report on the "interdisciplinary analysis" referred to on page 40? Does the capital cost of large, commercial power plants "estimated to be \$1,000 to \$1,100 per KW of capacity" refer to the next plant to be built by Colorado Ute or is it on historic planning figure? Does the \$1,000 to \$1,100 figure include the cost of facilities to deliver the generated power to the project site, such as the Horseshoe Park line and a pro rata share of the 345 KV line and its associated transformer stations? The proposed small plant "could cost as much as \$2,000 to \$2,200 per KW." Does the phrase "could cost" compared to "estimated" for the big plant mean that there is less confidence in the small plant figure?

Cool burning, fluidized bed combustors, coupled to steam turbine generators are currently available from European manufacturers. The Dept. of Energy has been funding prototype development of more advanced gas turbine systems by U.S. manufacturers and these should also be available in the time frame needed for the Mt. Emmons Project. These systems have higher efficiency, less pollution, and lower cost than steam systems. In addition, they have no cooling water requirements or water vapor emissions.

Why were these modern systems not considered? Since potential pollution, noise and visual intrusion will depend strongly on design and siting, why were these matters not addressed in the "interdisciplinary analysis"? Shouldn't some credit be given for the elimination of all impact on Horseshoe Park that the on-site alternative makes possible?

Page 223: A 230 KV line over Horseshoe Park is described as being superior in every respect to a 115 KV line. Why, then, is a 115 KV line specified in the Forest Service Preferred Alternative?

Page 226: A figure of \$.03/kwh is used for the cost of electricity. Whose cost is this? Is this the wholesale rate to SCEA? Would savings from reduced losses pay the cost differential for the 230 KV system?

Page 227: The "linear nature of the cleared right of way" is recognized as a key cause of visual impact. Steel towers can be cont'd to properly carry the load of a zig zag corridor. Why is this mitigation not addressed?

Page 228: "An estimated 10 percent of the inventoried visual quality objectives in the Kehler Pass-Horseshoe Park area will not be met." This is a serious impact that could affect the local recreation and tourist industry. (See Issue 11.) Once an area is developed, it cannot practically be undeveloped. Why is this impact not included as an irreversible commitment of resources on Page 237?

Page 229: For the undergrounding option, 230 KV pipe-type oil cooled cables are analyzed. This system poses serious engineering and environmental problems and has the appearance of a straw man. An alternative would be direct

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See FEIS Appendix I.

Page 194 does not say electric ore haulage is cheaper. The discussion points out that an electric rail system would consume less energy annually. Most importantly, however, a diesel-electric system was analysed in Alternative 7 because it was perceived that the overhead power system used for electric rail haulage would be unacceptable in this ore haulage corridor. See DEIS Figure G-10.

23-16

This discussion is a substantial documentation of the generation analysis. The capital cost of \$1,000 to \$1,100 is the cost to turn a new plant on today and does not include any transmission facilities. The second capital cost figure of \$2,000 to \$2,200 is of comparable accuracy to the first.

23-17

See Response 23-11.

23-18

See Response 23-11.

23-19

DEIS p. 223 points out that a 230 KV system would have capital and operating costs about 38 percent higher than a 115 KV system. In this respect a 115 KV system is superior.

23-20

The figure of \$.03/kWh is merely used to translate the line losses into a meaningful dollar figure. It could approximate wholesale rates. But, when the time rate of money is considered, the annual savings in reduced line losses do not pay for the front end capital necessary to construct the higher voltage line.

23-21

The balance of this section (DEIS, p. 227, Visual Resources) points out that by improved clearing methods and design, the linear cleared right-of-way is not a problem.

LETTER 23 (continued)

FOREST SERVICE RESPONSES

23-22

The installation of a transmission line is not considered to involve an irreversible or irretrievable commitment of resources.

23-23

There is a significant difference between underground 25 kV electrical distribution lines and underground 115 kV electrical transmission lines. Several authorities note that, because of the differences, highly pressured oil-filled pipe-type systems are the most widely used underground transmission systems in the United States (EPRI, 1975; Miller, 1976; Gilman and Steeve, 1971). Therefore, the alternative analysed is not a "straw man," rather it is the most widely accepted alternative to overhead transmission lines.

23-24

The East River corridor is analysed in Alternative 4 and as frequently noted it would be possible to adopt this component into Alternative 7.

23-25

The value on DEIS p. 256 is revised to 200,430 tons of coal annually. See FEIS p. xxv. This revision better represents Colorado's coal fired generators as reported in CERI, 1980. It is improper, however, to compare these two figures for the purpose of identifying one more efficient than the other. While they each represent reasonable estimates of coal consumption, the estimating methods are different.

23-26

Life cycle costing is an analysis method most useful for aiding in very specific decisions regarding equipment investments where the number of variables can be minimized. Life cycle costing was not considered appropriate for EIS analyses.

23-27

The reasons for not analyzing onsite generation in detail are given on DEIS p. 40.

23-28

The underground segment, which is a part of the system discussed on DEIS p. 349, would be designed to handle 250 megawatts. The data on costs are fairly presented by the specific analysis on DEIS p. 35 and the general analysis on DEIS p. 229.

23-29

The DEIS analyses the undergrounding of approximately 6 miles of transmission line. The costs used were 6 times and 20 times the cost of overhead transmission lines, \$110,320 per mile.

23-30

See Response 23-11.

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burial of individual, conventionally insulated wires, using a vibratory plow. This alternative would solve the engineering and environmental problems, but lower voltages and larger wire would be necessary on the underground segment. What are the economic trade-offs for this alternative? How would the potential for putting virtually all of the underground segment in or near the road reduce other impacts?

There are other possible techniques of undergrounding power. Gunnison County now has 300 miles of 25 KV buried line. These were not mentioned or analyzed. The case against High Pressure Oil Filled (HPOF) 115 KV lines was well made. Nothing else was considered. The HPOF 115 KV underground was considered only in Alternative 6. The economic and technical considerations of all possible systems should be explored.

Page 236: The question raised on Page 35 concerning the desirability of common corridors is answered here. Alternative 7 is identified as having the least common corridor, but it would have had the most common, had an East River route been chosen.

Page 256: Coal consumption of 117,000 tons annually is required for electric generation. On Page 222, the figure 180,000 tons annually is given for a small plant. Is there this much difference in efficiency between large and small plants?

Page 310: Life cycle costing is recommended as a technique for promoting energy conservation. Was life cycle costing used in any of the E.I.S. analysis in order to comply with the CED requirement for identifying conservation potential?

Page 345 to 348: This discussion reinforces the impression that onsite generation was not considered seriously.

Page 347: Overhead line sizing for the Preferred Alternative 3 is 80 megawatts. On Page 349, overhead line sizing for Alternative 6 is 250 megawatts. Is underground sizing for Alternative 6 also 250 megawatts? Does analysis of the oversized system provide a fair basis for estimating the cost of undergrounding a portion of the preferred system?

Page 348: What distance of undergrounding was considered?

Page 350: What are typical per mile costs for materials and construction?

The D.E.I.S. supports several conclusions:

--Gunnison County Electrical Association wants to develop the Skito Substation.

--The use of common corridors is desirable.

--AMAX needs two power sources in a looped system for important safety and operational reasons.

--The WAPA lines south of Gunnison are adequate only for emergency, short-term use by AMAX, and

--An additional primary source of power is needed.

The issue of most concern here is the source of primary power and its impacts. The D.E.I.S. gives serious attention only to an overhead 115 KV line through Horseshoe Park to Poncha. Rather than continue piecemeal criticism of the implications and analysis of this alternative, let us consider another proposal as a complete package designed to achieve operational needs, conservation goals, and impact mitigation.

This new alternative is built around onsite power generation at the Alkali mill site. This location minimizes air pollution problems from liquid and solid waste because of prevailing winds; it minimizes pollution problems from liquid and solid waste because of its proximity to and location above the tailings area; and it minimizes noise and visual impacts because it is remote and easily shielded by terrain.

The power plant should be a modern fluidized bed combustor fed by a mixture of coal and limestone. This system has an efficiency of more than 35% and meets Environmental Protection Agency new source standards without stack scrubbers. Currently available systems drive steam turbines and require cooling towers, but within this decade gas turbine systems will be available that have even higher efficiencies and need no cooling water. Choice of system will depend on when AMAX chooses to proceed. Waste heat from the power plant can be used for process and space heat at the mill, saving energy and saving the cost of a separate steam plant.

Fuel should come from an expansion of the O.C. Coal Mine and can be transported by a conveyor connecting to a silo on a siding of the ore haul rail line. Use of this local coal will eliminate such heavy truck traffic (with associated noise and safety impacts) from Highways 50 and 135, and the use of the ore haul railroad allows both the mine site and the mill site to be served.

The power loop would be formed by a line from the mill following the ore haul corridor to the mine, then to Crested Butte substation, down the East River Valley following the present 69 KV corridor and connecting to the Skito station and the WPR 230 KV line. This routing maximizes the common corridors. By eliminating the need for the Horse Ranch Park line, this alternative eliminates all the associated environmental and economic impacts.

Onsite power generation can help mitigate impacts resulting from the eventual closing of the mine. At that time, the plant could be utilized by GCEC to supply Gunnison County needs. This would reduce cash flow out of the county, help maintain some employment, and thereby ease the shock of lost mine payroll.

Another potential energy conservation measure is to reduce the size of the coal fired steam plant at the mine and to heat the mine air by water evaporation. This method (referred to as the 'Stable Ice Stoves') has been used successfully by Inco Metals Company, Copper Cliff, Ontario at their Frodo-Stobie mine for more than 25 years. They circulate 625,000 cfm of air with outside temperatures averaging 15 degrees for the months of December through March and minimum temperatures of minus 30 degrees F. The water evaporation method heats the air to about 30 degrees F., thus saving large amounts of energy. About 160 BTU is provided by each pound of water used. Water consumption averages 200 gpm with peak usage up to 300 gpm. In sub zero weather this method supplies up to 25 million BTU per hour. Nothing in the design precludes scaling to larger or smaller sizes. More details can be found in the April, 1960 issue of 'Freemasonry' magazine, beginning on page 18. Not only does this method save energy (as GCEC desires), Inco says it saves money, and if applied at Mt. Emmons it would reduce air and water pollution impacts on Crested Butte.

AMAX early promised that Mt. Emmons would be a new generation mine. A 'new generation' does not evolve without a little innovation. Something beyond 1960's technology is needed. The Mt. Emmons Project has the potential for a number of very serious impacts. New ideas may lead to mitigation of these impacts. Business as usual will not.

The greatest conservation potential, sought by the GCEC, is likely to come from new ideas. Even if the Forest Service feels itself powerless to demand beneficial changes to the AMAX proposal, the obligation nevertheless remains to seek out, identify and display such opportunities.

DESIGN AND LAYOUT.

Relative to design and layout of the mine and mill sites, there is a lack of any apparent creative input at these initial stages. Given that this project is proposed for location in an area where existing visual quality is not only high, but economically imperative, initial design must incorporate technical landscape design plans, before surface facilities are constructed and to preclude a haphazard 'band-aid' approach. The critical importance of the tourist industry in this valley, coupled with concerns expressed repeatedly by area residents, strengthens this argument.

AMAX has participated in a conference on creative land form modification, in which it was demonstrated that large mining projects can provide opportunities for large earthwork sculpturing, and that in many of these cases, such conscious attempts to shape the land have actually proven economically beneficial. If the creative design is not introduced at an early stage, the result will be a 'tacked-on' plan, a penny-wise and pound-foolish approach, both for Gunnison County and for AMAX.

MOISE.

Issue 17 in Appendix H reads, 'What will happen to the 'Quality of Life' in Gunnison County if the proposed project is implemented?'

This question probably concerns more people in Gunnison County than any other issue listed in Appendix H, yet the D.E.I.S. dismisses this concern by the comment on Page 214 that, 'The discussions in this draft E.I.S. focus on subjects that are more definitive than the term 'Quality of Life'.' Certainly, quality of life has many dimensions and cannot be

23-31

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This possible mitigation measure has been added to FEIS Table B-4. However, before this measure is implemented it must be determined where to place the additional 400,000 cubic yards of waste rock which must be excavated and where to obtain the additional 300-600 acre feet of water per year.

23-32

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These dimensions have been analyzed separately in the DEIS under the following topics: Noise, Subsidence, Visual Resources, Housing, Transportation, Outdoor Recreation, Social Impact (DEIS p. 125), Social Effects (DEIS p. 213), Social Structure, Growth Impacts, and Agriculture. It was the integration of these factors into the single, subjective concept of 'Quality of Life' that was deemed unmeasurable.

measured with a meter; but these dimensions can be examined separately. Noise is one of the more important of these dimensions.

The significance of noise to the quality of life is expressed very well on page 7 of the report on the 'Environmental Baseline Study of Ambient Noise Levels for the Mt. Evans Project Area' (See reference: S&L, 1980B). It is instructive to quote in full two paragraphs from this scientific analysis:

"The noise environment throughout much of the Mt. Evans Project Study Area is typical of mountainous, moderately forested rural land areas. Activity on public road and in the more populated areas (Town of Crested Butte, Gunnison and Almont) produce noise emissions which are rapidly attenuated over the rugged terrain. The remote areas are characterized by sounds of nature including bird and insect calls, water noise from the many rivers and creeks, and the rustle of wind through vegetation. There is a slight seasonal variation in background noise levels, with summer and spring generally showing higher levels than autumn and winter. The effect is more pronounced in the more pristine areas where the sounds of nature dominate. This variation in levels is probably due to the life cycle of small wildlife such as frogs and crickets.

"In the more developed areas, for example, the Town of Crested Butte, the noise levels are generally higher due primarily to motor vehicle traffic. At night, however, the noise levels in residential areas are as low as those in the remote undeveloped areas. In both the populated and undeveloped areas, the noise from occasional aircraft passovers intrudes upon the generally tranquil environment."

Although the D.E.L.S. index lists 22 page references under the heading 'Noise', the entire discussion is summarized on page 253: "Minor, short-term noise impacts will result. These effects will not be significant." This conclusion is based on a contracted analysis (See reference: Mirabelli, 1980) that, for example, asserts (on page 139 of D.E.L.S.) that traffic on Highway 135 will increase noise in the Town of Crested Butte by 4 dB and in Almont and Crested Butte South by 2 dB. Noise from mine and mill construction and operation are considered to have no impact on any residential areas.

Although this analysis uses standard mathematical techniques, its conclusions are grossly in error because the techniques are inappropriate when applied to the Mt. Evans situation. Let us examine the deficiencies of two of the analysis techniques used.

The first error is in the use of 'equivalent' noise levels. This concept can be understood by imagining oneself standing a short distance away from a country road along which are passing 10 cars each minute. You hear an almost steady roar from this traffic. If the traffic were to increase by 10 times to 100 cars each minute, you would hear a roar that would seem twice as loud. This relationship in which 10 times as much noise energy seems only twice as loud is built into the mathematical equations used by Mirabelli; and the validity of this equation is well established for more or less continuous noises.

Now consider the highway again with only one car every hour. There is no steady roar. Instead, one can hear the frogs and the crickets, and every hour the noise of a car intrudes on your tranquility. If the traffic increases by 10 times to 10 cars an hour, then there are 10 intrusions per hour. In this situation, loudness is not so important as the number of intrusions; so with 10 times the traffic you perceive 10 times the impact—not twice, as the loudness equation would still predict.

Most of Gunnison County is very quiet by urban standards. For example, ambient background noise levels are typically 25 dB or less (See reference: S&L, 1980's) even in Crested Butte in residential neighborhoods. The sounds of human activity appear as individual events above this background level (a dog barking, a car passing, a door slamming, a chainsaw running, etc.). These human sound events are frequent during the day, but when work is done, tranquility settles over the town. Against this low background, the steady hum of a mine exhaust fan or the passage of many vehicles at a shift change will be clearly apparent. The bustle of day will increase, and the tranquility of night will be lost, thus making the community less desirable for residents and tourists alike.

A truck passing Crested Butte on the proposed bypass south of town would cause a noise level of 79 dB a hundred feet away (p. 139). The nearest residences would experience a noise impact about 50 dB above background or an apparent 32 times as loud (two times for each 10 dB or $2 \times 2 \times 2 \times 2 = 32$). This is too loud for conversation, music, or any other pleasant acoustic experience. Even all the way to the north edge of town the noise would be 20 dB above background or four times as loud—more than sufficient to drown out the sounds of the frogs and crickets. The rural quality of life is lost when traffic and other activity becomes so intense that there is no time when the frogs and crickets can be heard between other, higher level, 'noise events.' The analysis method of Mirabelli (though perhaps appropriate in metropolitan cities) is meaningless in Gunnison County, as is the Colorado State standard of SSDP equivalent for residential areas (page 208).

A second analysis error by Mirabelli is in use in the use of a flat earth assumption in calculating sound propagation from the Coal Creek mine site. With this assumption, a combination of geometric expansion of the sound waves, plus atmospheric absorption, leads to a sound level reduction of about 85 dB over the distance of three miles from the mine to the Town of Crested Butte. Starting with a noise level of 93 dB at 100 feet from the ventilation at the mine site would leave an 8 dB sound level in Crested Butte--well below the 25dB background and completely inaudible. The problem is the world is not flat around the Coal Creek mine site. We all know how sounds echo down canyons. If the Coal Creek Canyon were made up of two flat walls, then the mathematical calculation leads to a noise level of 30 dB in town--quite audible against the background of 25dB.

If we go back to the flat earth calculation and consider a weather condition with a temperature inversion such that sound reflects from the atmosphere instead of spreading upward, then we again calculate 30 dB of noise at a distance of three miles. (We encounter this situation often on cold winter mornings when voices and other sounds carry such long distances.) If we combine these two situations, with a temperature inversion in a parallel wall canyon, then we calculate over 50dB in town--a roar that would drown out all frogs and crickets for the life of the mine. This worst case 50 dB is not realistic (even if we add a down canyon wind to carry the noise); but the 30 dB can be expected and 6 if not much, of the time, from a combination of echoes, canyon walls, temperature conditions, and wind. None of these factors are included in Mirabelli's analysis.

The specific discussion of noise impacts on Crested Butte is intended to illustrate the deficiencies of the Mirabelli analysis. Applying similar arguments to the City of Gunnison and other areas in the county makes it clear that noise associated with the Mt. Camanche Project would seriously detract from the quality of life in the county as feared by so many people. There is also the degradation of the recreational quality of thousands of acres of recreation land in the Gibson's Ridge/Mt. Axial/Keeler pass area to be considered as well as the economic impact this would have on the recreation and tourism industry. Much more detailed design and analysis of noise mitigation measures is necessary before the statement can be made that noise impacts will not be significant.

TRAFFIC/TRANSPORTATION.

The D.E.I.S. documents the extreme impact mine-generated traffic could have on the road system in Gunnison County (see Index under Transportation). Not specifically addressed are the impacts of traffic on the Gunnison business district and the special problem of school buses on Highway 135 at higher levels of traffic. Additional mitigation should be addressed, such as off-highway school bus stops and a City of Gunnison bypass road.

MINE SITE.

The discussion of the 10,000 ton per day alternative is another example of a straw man which has been proposed by the Forest Service as a "reasonable alternative," and then abandoned as impractical. The small mine alternative originated with Gunnison County, which hired Professor Alfred Petrick of the Colorado School of Mines to review AMAX's 1979 order of magnitude data in terms of the economic feasibility of a lower production rate. Professor Petrick's study concluded that a 10,000 ton per day Coal Creek mine/Alkali Creek mill was feasible. Accordingly, the small mine alternative was discussed during the scoping process and found its way into Appendix H: "Reference Guide for Issue Analysis" as expressed by Issue 10: "What would the mining impacts of a mining operation scaled down so as to require fewer employees and operate over a longer period of time?"

One of the main reasons for the County's interest in this alternative is the longer mine life. A lower production rate would generate fewer social, economic, and environmental impacts, as the D.E.I.S. concedes, and a longer mine life would reduce the impact of mine closure because the loss of tax and economic base would be more easily absorbed by an expanded economy. Furthermore, a longer mine life would provide "a better base for local economic development" than a shorter mine life. See D.E.I.S., Page 217.)

Nonetheless, based on AMAX' unverified claim that the 10,000 ton per day Coal Creek mine/ Alkali Basin mill was not economically feasible, the Forest Service I.D. team unilaterally twisted the small mine alternative into a model which wasted most of the mineral resource and was sure to be rejected by virtually everyone (including the County). In light of the current polydema glut, which trade publications indicated may well last into the 21st century, it appears that all of the development alternatives are uneconomic.

23-34

Noise sources at the mine site are accurately described in this comment. However, baseline noise levels are not described accurately: SAI (1980b) indicated background noise levels in the Town of Crested Butte of 40-57db, not the 25db figure cited in the comment. The comment's predicted 30db noise level in Crested Butte from Coal Creek mine site noises thus falls below measured background levels, and is in agreement with the DEIS statement "...and in the Town of Crested Butte these noises will be well below background levels even at night." (DEIS p. 136).

23-35

The transportation discussions beginning on DEIS p. 121 and in the comparative summary (DEIS, p. 32) address, in a general way, impacts on the City of Gunnison's business district. This coverage is adequate to choose between alternatives.

Discussion of school bus/traffic interactions and their mitigation have been added. See FEIS, p. 10.

23-36

DEIS p. 42 gives the reasons for not analyzing this alternative in detail.

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LETTER 23 (continued)

FOREST SERVICE REPSONSES

Accordingly, we can perceive no rational basis for omitting from the D.E.I.S. the 10,000 ton/day Cool Creek mine and Alkali Creek mill proposed by the County and identified as Issue No 10 while including other, equally unviable alternatives. We urge that this omission be remedied in the final E. I. S.

36

WATER.

The effects of construction of a mine using water formerly available for irrigation and thus agriculture, plus the very valuable aesthetic benefits of a green valley, as well as the quality of life and the tourism industry, are ignored by such small statements as, "The situation would be expected to revert to historic systems if irrigation water were terminated (pg. 104)."

23-37

The effects of 3,000 acre feet of annual water consumption (water formerly maintaining the green valleys), on visual resources in this valley are completely overlooked. The statement on page 253 that, "short term visual impacts in the project area will not significantly change the visual character of the landscape over the long term" seem premature, since "degreening" meadows is not even discussed, let alone any possible effects on adjacent groundwater conditions.

37

Water quality for the entire County, including the Town of Crested Butte is a major concern of residents in this valley and this D.E.I.S. lacks in its analysis of this issue.

23-38

The analysis is adequate.

38

CONCLUSION

It is our understanding that specific mitigation measures will not be recommended as part of the E.I.S. procedure until a particular alternative has been selected for permitting.

However, when the Forest Service and the proponent conduct discussions of a specific proposal involving a specific permit with specific mitigation measures, the County wants to be notified and provided an opportunity for further involvement and comment.

We recommend that the "Decision Document," and final E.I.S. more formally, effectively, and specifically address and require certain mitigation measures, at least as applied to Forest Service land.

It is vital that the Forest Service be aware of the County's proposed mitigation measures before any permits are issued. Accordingly, we urge the continued involvement of the County with the Forest Service and proponent through the Colorado Joint Review Process, even after the completion of the final Environmental Impact Statement.

LETTER 24

Gunnison County, Colorado

Board of
COUNTY COMMISSIONERS

GUNNISON, COLORADO

MEMORANDUM

TO: Jimmy Wilkins, U.S. Forest Service
FROM: Gunnison County
RE: D.E.I.S. Response

Please note that the first sentence of Paragraph 7 of page 1 of Gunnison County's submitted response should read: "However, Page 2 of the AMX Fourth Quarter Report, 1981, states, 'construction of facilities at Mount Tolman...has been terminated. The decline in molybdenum consumption--with the resulting buildup in producer inventories and price reductions--that has come out of the prolonged worldwide recession was a major contributing factor in the decision to curtail activities. The Company also announced reductions in manpower and production at its western operations beginning in January, 1982. Production from the two Colorado molybdenum mines will be reduced approximately 25 to 30 percent with a reduction of 800 to 900 employees in the mines and offices through retirements, layoffs and in some instances, terminations."

LETTER 25



City of Gunnison

BOX 239 • GUNNISON, COLORADO 81230 • (303) 641-2443

Mayor

BOB DECKER

City Council

DEE BLACKLOCK

PAUL SAMMONS

S.J. SANGOSTI

HESE STONE

March 12, 1982

Mr. Jimmy R. Wilkins
U.S. Forest Service
1063 Main Street
Delta, CO 81416

Dear Mr. Wilkins:

The City of Gunnison has been an active participant in the Colorado Joint Review Process as it applies to the Mount Emmons Project. We have also participated in the Forest Service Scoping Process for the Mount Emmons Environmental Impact Statement. Because the vast majority of financial and social impacts will have to be solved by the City of Gunnison, we feel especially compelled to provide critical comments on the Draft Environmental Impact Statement.

We have reviewed the Draft E.I.S. in detail, comparing the document with the AMAX Mount Emmons Environmental Report as well as the BML Mount Emmons E.I.S. Social and Economic Studies for the 10, 20, 30 thousand ton per day mining alternatives. After completing this review, we find the Mount Emmons Draft E.I.S. to be generally disappointing.

We have been told that the most effective way to comment on the Draft E.I.S. is to prepare an itemized list of the points that we feel are deficient. This letter attempts to do this by grouping our comments into appropriate categories with page references.

A. General Format and Content

1. The Mount Emmons Draft E.I.S. is very difficult to follow even for professionals that have been actively involved in the evolution of this document. A table or chart from listing alternatives with comparisons of their respective impacts and mitigation strategies would be very helpful for all people attempting to understand the meaning of this Draft E.I.S.
2. The Draft E.I.S. Summary, Page iii, states, "The environmental consequences on lands and activities administered by other Federal, State, and local jurisdictions resulting from the proposed action are disclosed in this Draft E.I.S."

Mr. Jimmy R. Wilkins

2

March 12, 1982

This statement does not appear to be adequately substantiated by the text. There is no systematic evaluation of the comparative impacts between the various Draft E.I.S. alternatives as they apply to the City of Gunnison or any other local jurisdiction.

3. The summary discussion of impacts does not adequately evaluate comparative costs and benefits of the project alternatives. In fact, the last paragraph is the only mention of monetary benefits. No mention is made of specific monetary costs to the Forest Service or the local jurisdictions.

B. Population Increase and Growth

1. While it is true that the no action alternative will still produce population growth, BML projections identify City growth rates that approach and often exceed ten percent (10%) annual growth rates for all action alternatives. We would like more information on the 10,000 TPD Mine. For example, electricity, water, noise, and transportation.

C. Utilities and Services

1. Seventy-three percent of all social and financial impacts will have to be fiolded by the City of Gunnison, no where does the Draft E.I.S. provide any evaluation of fiscal and service impacts based on the various alternatives. The ANAX E.R. discusses Alternative #2. The BML Report discusses Alternative Number 1 and 2. What about the other five scenarios? What happens if the State Division of Wildlife is successful in promoting their preferred Alternative #7?

2. This Draft E.I.S. almost completely ignores the most important environment that the City of Gunnison has. That is the "City." Where are the comparisons of the environmental effects of alternatives required in Section 1502.14 of NEPA? What about the effects of new utilities construction on fees, taxes, and bonding? ANAX developed projected assessed valuation figures, why does the Forest Service ignore them?

D. Visual Impacts

1. Alternatives 2-6 appear to require significant expansion of the Skito Substation. This substation is visible from most places within the City of Gunnison and yet these impacts are not once discussed in the Draft E.I.S.

E. Noise

1. Page 208, Noise, provides the only detailed discussion of noise levels. Why weren't decibel ratings predicted for all alternatives? On Page 189, Noise, the Draft E.I.S. is talking about the Chance Gulch Mill Site Impacts and it says, "Impacts will be similar to those described

1

25-1

This information is in BML (1981c).

2

25-2

Fiscal and service impacts on the City of Gunnison are summarized on DEIS pages 215-218. This information is based on the greater amount of detail available in BML (1981b Chapters 10 and 11).

The socioeconomic discussions of Alternatives 1-7 in the DEIS are covered in greater detail in BML (1981a-d).

25-3

3

Impacts on the City of Gunnison are included on DEIS pp. 112, 115, 124-126, 128, 189, 190, 195, 196, 199, and 203-219. Comparisons of alternatives are on DEIS pp. 28-37. Effects of new utilities are discussed in detail in BML (1981b Chapter 11, pp. 11-53 through 11-62). Baseline assessed valuations are listed in Table 3-8 (DEIS p. 82); Project-influenced assessed valuations are listed in Table 11.2-A2 (BML, 1981b,c,d page 11-23).

4

25-4

The DEIS discusses the proposed changes in the Skito substation on p. 347, and DEIS p. 114 notes that new forms, lines, colors, and textures will be introduced into local landscapes. The substation changes, however, are not considered as significant as the major facilities listed on p. 114.

5

25-5

Other detailed discussions of noise levels occur on DEIS pp. 65, 133-136, 139, 146, 158, 166, and 227.

Mr. Jimmy R. Wilkins

3

March 12, 1982

for Alkali Creek, except that some residences located along the Tomichi Creek Valley may occasionally be impacted by project noises, particularly during construction." This "noise" may occur near the City of Gunnison, the largest population center, in fact on Page 31, noise has a high risk adverse impact for Alternative #7. The evaluation of noise on Page 158 doesn't make the potential impacts very clear to the Gunnison community when the Page 189 discussion uses words like "may" and "similar to . . . Alkali Creek."

F. Land Uses

1. Page 191, Land Uses, last paragraph, discusses impacts on land use from Alternative #7 and states "no urban, suburban, or agricultural land will be affected by this alternative." Page 33, Land Uses, third paragraph states the demand for land use change will be greatest under alternative #7. Which way is it going to be? Page 200, under Chance Gulch Mill access states, "No significant effects on land uses are expected as a direct result of this access road." These sections should be consistent.
2. Page 128, states, "An indirect effect from population increase caused by the mining operation will be an increase in land area used for urban, suburban, commercial, and industrial purposes." What relationships will each alternative have on the location and development of land uses. What about industrial support facilities, machine shops, etc.?

G. Transportation

1. Major traffic increases will be in the City of Gunnison and along roads to mine and mill sites. We feel this needs to be addressed in Table 4-4 Page 122, as it applies to the City of Gunnison and Alternatives 6 and 7.

H. General Comments

1. Page 83, first full paragraph in righthand column. The County Housing Authority cancelled their low income project and the City of Gunnison has adopted new subdivision regulations. We are still working on new utility regulations (water and sewer) and a new zoning code.
2. Page 86, Financial Condition (2) we feel that the students contribute a great deal to local government revenue in the form of local sales tax. This sales tax constitutes the vast majority of our operating revenues.
3. Page 86, second full paragraph in righthand column. The City does not rely on transferring utility funds nor do we use those funds for "general government expenses." We use these funds for utility related administrative expenses only.

25-6

There are important distinctions between the citations made in this comment. The statement cited from page 191 relates to site specific impacts at the location of the Chance Gulch mill site. The statement cited from page 33 relates to indirect demand for land use change resulting from population growth. The statement cited from page 200 again relates to a site specific land use impact from constructing a mill access road. A careful reading will point out there is no inconsistency in these statements.

25-7

Spatial allocation of residents is discussed on DEIS pages 210-213. Table 4-48 (DEIS p. 214) lists this information for the year 1994, and includes the results for Alternatives 1-7. Greater detail is available in EML (1981a,c,d Chapter 4/5). DEIS p. 199 indicates that, with a mill at Chance Gulch, 76 more employees will live in the Gunnison area compared to the other mill locations. The exact location of new development in the Gunnison area could not be assessed.

25-8

Alternative 6 transportation impacts are addressed on DEIS p. 209. For more details see EML (1981c, Section 10.5). Alternative 7 transportation impacts are discussed on DEIS p. 199.

25-9

See FEIS p. 6.

25-10

See FEIS p. xxiv.

25-11

This statement has been deleted. See FEIS p. xxiii.

LETTER 25 (continued)

FOREST SERVICE RESPONSES

Mr. Jimmy R. Wilkins

4

March 12, 1982

4. Page 89, General Government Services, third paragraph, the City employs 64 people not including police department employees.

5. Page 96, do the proposals presented in the Draft E.I.S. all conform to the East River Plan? Do they conform to the July 11, 1979 Special Occupancy and Use Regulations?

6. Page 253, Visual Resources. This can't be a proper response to the regulatory requirements. What about the short term effects that become long term, also outdoor recreation?

7. Page 254, Socio-economics, states, "Over the short term local economic conditions will adjust to the project's initiation, and later to its departure." Also, Page 217, in the E.I.S., states that the mine will provide stable employment. These statements are inconsistent with the historical evidence supplied by other communities that have gone through "boom/bust" cycles.

Conclusion

We feel that, as presented, Alternative #7 presents the most adverse impact on the City of Gunnison. For example, the noise associated with proximity to the City, the length of the ore haulage route, the potential effects of altering land use patterns and the visual effects, all seem to be the most severe under this alternative. Therefore, the City of Gunnison wishes to oppose Alternative #7.

We hope that the Forest Service will reevaluate this Draft E.I.S. in light of the available data and produce a Final E.I.S. that addresses the concerns expressed by the City of Gunnison and is worthy of the time and effort that so many people have contributed to this project.

Respectfully submitted,

Bob Decker
Bob Decker, Mayor
Gunnison City Council

See FEIS p. xxiv.

25-12

25-13

See FEIS p. 20.

25-14

Short-term visual impacts will generally be mitigated through design considerations and reclaimed as soon as possible afterwards. Long-term impacts will thus be minimal.

25-15

The first statement remains as is. The second statement has been clarified and is included in the discussion on FEIS pp. 17-18.



City of Gunnison

BOX 239 • GUNNISON, COLORADO 81230 • (303) 641-2443

Mayor

BOR DECKER

City Council

DEE BLACKLOCK

PAUL SAMMONS

S.J. SANGOSTI

TESSE STONE

March 18, 1982

Mr. Jimmy R. Wilkins
U.S. Forest Service
1063 Main Street
Delta, CO 81416

Dear Mr. Wilkins:

The City of Gunnison's Planning and Zoning Commission would like to thank the Forest Service for the opportunity of responding to the Mt. Emmons E.I.S.

Many problems and impacts have been identified as affecting the City of Gunnison, but, in many instances, to the best of our knowledge, no mitigation measures have been offered; i.e., potential traffic congestion at the junction of State Highway 135 and U.S. Highway 50 in the core of downtown Gunnison (Page 122 and Table 4-4), and the related changes in noise levels and air quality within the City, particularly with reference to Alternative #7.

We concur with the Gunnison City Council in opposing Alternative #7 because of the adverse impacts related to the ore haulage route, the potential effects of altering land use patterns and the changed visual effects, as they relate to the City of Gunnison.

As the County and Forest Service begin to consider land use changes and the issuance of various permits, we would like to urge the continuing involvement and cooperation on the part of the City, the Forest Service and the proponent.

We appreciate the opportunity to comment on the Mt. Emmons Draft E.I.S. If the City Planning Commission can be of service to you as you finalize the E.I.S., please let us know.

Respectfully submitted,

Wm. J. Nesbitt, II

Wm. J. Nesbitt, II, Vice Chairman
Gunnison Planning and Zoning Commission

LETTER 26

Town of Crested Butte

P.O. Box 39

Crested Butte, Colorado 81224

—A National Historic District—

Phone: (303)349-5338

March 15, 1982

Mr. Jimmy Wilkins
Forest Supervisor
United States Forest Service
1063 Main Street
Delta, Colorado 81516

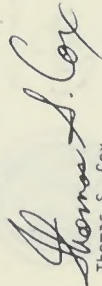
Dear Jimmy,

The Town of Crested Butte herewith submits its comments on the draft environmental impact statement. These comments have been prepared by the planning office after a series of work sessions and consultation with the Town Council. We have also included a copy of Resolution #1, 1982 passed unanimously by the Council on March 1, 1982.

While our comments on the draft have been largely critical we would like to take this opportunity to commend your entire team on the tremendous time and effort put into the preparation of this document. This has not been an easy task and we appreciate the openness and responsiveness with which your agency has operated over the past three years. Our comments are submitted with high hopes that the cooperative effort will continue and that the Forest Service will be responsive to our concerns.

Should you have any questions about our submittal please do not hesitate to call me or my staff.

With best wishes,


Thomas S. Cox
Mayor

TSC/krf

Enclosure

LETTER 26 (continued)

March 15, 1982

Mr. Jimmy Wilkins
Forest Supervisor
United States Forest Service
1063 Main Street
Delta, Colorado 81416

The Town of Crested Butte appreciates the opportunity to comment on the U.S. Forest Service's draft environmental impact statement for the AMAX Mt. Emons project. Having been involved in the evaluation process for this proposal for almost five years and believing that the residents of the town will be among the most seriously impacted by the mine, we offer comments in substantial detail. Our comments are organized into the following categories: 1) general comments on deficiencies in the draft methodology, 2) watershed wetlands and water quality impacts, 3) socioeconomic impacts, 4) other impacts to the Town of Crested Butte, 5) the land trade proposal, and 6) the need for the project.

General Comments on the Draft EIS: Its Analysis, Its Assumptions, Its Methodology.

As all of us are aware, a tremendous amount of information has been generated in order for the public and agency decisionmakers to fully understand the impacts of a major molybdenum mine three miles west of Crested Butte. Private and public money and time has been spent, a vast library of baseline data has been compiled, seemingly endless meetings have disclosed a broad range of concerns. It is with great disappointment therefore that we respond to a document that contains little analysis, that does not treat alternatives equally, that does not justify the choice of a preferred alternative and indeed, reads like a thinly-veiled justification for AMAX's proposal. Although a number of serious impacts are identified, the Forest Service has not taken a critical look at the mitigations proposed, has assumed mitigation to be in place for the impacts discussed in Chapter 4 and has failed to clearly identify those impacts which are not mitigatable -- over both the short and long-term. We believe this document therefore violates both the spirit and the letter of the National Environmental Policy Act as clarified by the Council on Environmental Quality NEPA regulations.

Ultimately, of course, it is not better documents but better decisions that count. NEPA's purpose is not to generate paperwork -- even excellent paperwork -- but to foster excellent action. The NEPA process is intended to help public officials make decisions that are based on understanding of environmental consequences, and take actions that protect,

LETTER 26 (continued)

Mr. Jimmy Wilkins
March 15, 1982
Page 2

restore and enhance the environment." ("Purpose" CEQ NEPA regulations 40 CFR 1500.1(c) cited in Wilkins' letter to Light (HCCA) dated June 11, 1980.) This document neither helps public officials understand the environmental consequences nor does it "foster excellent action" which protects, restores or enhances the environment. All consequences are not clearly presented. Mitigation measures are identified for some impacts but are not critically analyzed. Mechanisms for enforcement are not discussed at all. We can only assume, then, that serious short and long term consequences to both the human and natural environment will be unavoidable.

One of the major defects in the draft EIS is the lack of justification for the choice of a preferred alternative. The seven alternatives are never discussed as a whole so that comparative impacts are apparent to the decisionmaker or the public. FSM 1951.9 requires that "The rationale used in identification of the preferred alternative must be documented in the EA or EIS." Since, by definition, a draft EIS should be something closely approximating the final document, the decision to eliminate the preferred alternative justification seems arbitrary. Only in the final document, when there is no longer opportunity for public input, will the public be allowed to scrutinize the agency's rationale for its choice of alternative 3: approve the mine essentially as proposed. This is in conflict with the requirement of Section 1502.9(a) of the CEQ guidelines which states: "The draft statement must fulfill and satisfy to the fullest extent possible the requirements established for final statements in section 102(2)(C)."

Other CEQ requirements which apparently have not been met include:

- A discussion of conformance or conflict with federal, state, and local land use plans, policies and controls (which include "formally adopted policy statements." A good example is Resolution #2, 1979 adopted by the Town Council of Crested Butte on February 20, 1979).
- A complete discussion of any probable adverse environmental effects which cannot be avoided.
- A discussion of other interests and considerations of federal policy thought to offset the adverse environmental effects of the proposed action.

Compliance with CEQ guidelines will not be complete until these discussion items are included.

Although the alternatives section should be the "heart" of the EIS and CEQ regulations 1) require the analysis of the no action alternative (even if the agency is under a court order or legislative command to act), 2) require that "each alternative in the EIS is to be substantially similar to that devoted to the proposed action" (FR vol. 46 No. 55 March 23, 1981, p. 18028), and 3) ask that the alternatives section

FOREST SERVICE RESPONSES

26-1

This discussion is presented in Comparison of Alternatives, DEIS pages 28-37. Comparisons of a more detailed nature can be found in many places in Chapter 4.

26-2

Forest Service direction implementing NEPA is contained in the Forest Service Manual (FSM) Chapter 1950, Forest Service Handbook (FSH) 1909.15 and the Council on Environmental Quality's regulations in 40 CFR Parts 15001508. FSM 1950 and FSH 1909.15 were rewritten effective November 19, 1981, and no longer require documentation of the rationale used in identifying the preferred alternative (Federal Register Vol. 46 No. 223, November 19, 1981, pages 56998-57017).

26-3

Because it is difficult for one agency to evaluate possible conflicts with the plans or policies of other authorities, it was anticipated that such conflicts would be identified during public comment on the draft EIS. However, very few of the comments received described specific policy conflicts. This may be because most planning policies are designed to be dynamically flexible, blocking outrageously unacceptable developments and permitting compromises for acceptable ones. This topic is addressed on FEIS pages 19-21.

26-4

This information can be found throughout Chapter 4 of the DEIS and FEIS.

26-5

A discussion of this nature is more appropriately included in the Record of Decision.

LETTER 26 (continued)

Mr. Jimmy Wilkins
March 15, 1982
Page 3

"rigorously explores and objectively evaluates all reasonable alternatives." the draft EIS virtually ignores the No Action Alternative in its analysis. This alternative (#1) is simply listed as an alternative. It is obvious, even to the casual reader, that the alternative is given no weight. Indeed, it would seem that the agency is allowing what it perceives to be its decision authority (or lack thereof) under CER 228 to guide the level of analysis of this alternative in the draft. This analysis is neither "rigorous" nor "objective" and must receive a great deal more attention in either an amended draft or final EIS for compliance with the CEQ guidelines.

One of the most critical flaws in the draft is the assumption that mitigation is in place for the impacts discussed in Chapter 4. In fact, the entire "Environmental Consequences" section is biased because mitigation measures are discussed and assumed. This obviously tends to minimize the nature and extent of any impacts and therefore biases the reader toward the proponent's alternative. For instance, the entire analysis of direct impacts on aquatic ecology states: "The Project is designed so that the probability is extremely low for discharge of process water and it includes a tailing impoundment designed to prevent seepage. Water from the mine will be either used in the milling process or treated prior to discharge. Therefore no significant impact on the aquatic ecology of Gunnison County is predicted." (p. 106) emphasis added.

In the "Environmental Consequences" section, mitigation measures are discussed on pp. 101, 102, 103, 104, 105, 106, 108, 109, 113, 114, 115, 121, 127, 128, 130, 131, 132, 133, 136, 137, 138, 139, 140, 144, 146, 147, 149, 151, 152, 153, 154, 158, 159, 160, 162, 163, 165, 166, 167, 168, 175, 181, 188, 190, 195, 196, 205, 210, 215, 216, 218, 219, 226, 227, 228, 231, 232, 236, 237, 238, 239, 249, 250, 251, 252, and 255. All discussion of mitigation measures must be deleted from Chapter 4 and included in Appendix A or B. In this way, impacts can be clearly understood because they are not minimized by an automatic assumption of mitigation.

This is a crucially important distinction because the draft EIS does not discuss the viability of the various mitigation measures (but assumes if AMAX says they will work they will), does not address the mechanisms by which both on-site and off-site mitigation measures will be implemented, does not require mitigation measures be implemented on non-forest System lands and therefore offers no guarantees that any mitigation measures will be in place.

It should be noted here that it is not at all clear whether any mitigation measures can be enforced after the land trade is complete since public lands will become private and FLPMA (1976) specifically prohibits attaching conditions to land trades. (Sec. 208)

FOREST SERVICE RESPONSES

26-6

The No Action Alternative was analyzed in detail sufficient to make a reasoned choice among alternatives. The results of these analyses are documented throughout the DEIS, the following pages being illustrative: 28-33, 73, 77, 82, 85, 119, 122, 124, 203, 204, 206-208 and 212-217.

26-7

The DEIS is correct in assuming that mitigation measures which the Forest Service can require are in place (DEIS p. 301). The CEQ specifically requires that when agencies discuss the proposal and the alternatives they shall include appropriate mitigation measures (40 CFR 1502.14). In fact, it would be unrealistic to display the effects of a totally unmitigated project. When uncertainty existed over the implementation of mitigation measures, worst-case analyses were presented.

26-8

The mechanisms for implementing both on-site and off-site mitigation measures are discussed on DEIS pp. 3 and 301.

26-9

Section 208 of FLPMA does not apply to conveyance documents for land exchange, Section 206(b) does apply. The secretary can issue less than fee simple title, including reservations and restrictions by the United States determined to be in the public interest.

LETTER 26 (continued)

Mr. Jimmy Wilkins
March 15, 1982
Page 4

Until further proof of mitigation compliance we must assume a worst case scenario which would be more accurately described in the document if Chapter 4 was rewritten to exclude mitigation measures and include a specific discussion of unmitigable impacts ("any probable adverse environmental effects which cannot be avoided.")

Another issue that has been repeatedly raised by the Town of Crested Butte is the issue of validation of data supplied by the proponent. This is never discussed in the draft. The methodology section should include a section on how this process was used in analyzing information developed by consultants paid for by the proponent. We suspect that much of this information was taken at face value. For instance, the construction workforce has been estimated by AMAX to be 625 people although this workforce at Henderson was over three times larger (AMAX estimates, actual numbers may have been higher). When the socio-economic consultants (Briscoe, Maphis, Murray and Lamont) were asked if this number could be validated, they indicated they believed this was a function of Forest Service analysis. Unfortunately, the Forest Service position, when questioned, was that they had no independent means of verification. The EIS thus reflects the AMAX figure, with no attempt at validation. This is precisely the situation envisioned by the Council on Environmental Quality when it stated: "An agency must include a worst-case analysis of the potential impacts of the proposal and an indication of the probability or improbability of their occurrence if...the information relevant to adverse impacts is important to the decision and the means to obtain it are not known." (FR vol. 46 No. 55 March 23, 1981, p. 18032)

If the Forest Service has no means of validating this suspiciously low number then it should do a worst-case analysis and indicate the overall secondary impacts based on triple the construction force previously identified by AMAX. Since the number of "boomers" who will arrive in Gunnison County looking for jobs without success is also unknown the worst-case analysis should also attempt to project how many unemployed new residents will be added to Gunnison County's population. This worst-case analysis could then more accurately reflect the socio-economic ramifications of the AMAX project.

There are a number of these critical data points in the EIS that require fuller scrutiny. The geology of Alkali Basin is such an example. AMAX data has portrayed the basin as being underlain by an impervious shield of Mancos Shale; this happy coincidence will supposedly protect the East River Valley -- and the highly sensitive Roaring Judy Fish Hatchery--from any contamination from the leaching of toxic tailings material. What validation of this geologic data has been done? What proof is there that this Mancos Shale does not contain significant fractures which may cause toxics to flow towards the East River rather than thousands of feet below Onto Creek as previously speculated? The draft EIS assures us "ground-water contamination will be controlled by the relatively impervious character of the Mancos Shale, the formation's westerly dip and the planned method of dam construction" (p. 154). The remaining discussion goes on

FOREST SERVICE RESPONSES

26-10

To paraphrase CEQ regulation 1506.5(a), the Forest Service is responsible for the accuracy of the information it uses, and must include in the list of preparers the names of those persons who performed independent evaluations of data used in the Mt. Emmons EIS. Those persons are listed in Chapter 5 of the DEIS.

Validation was an ongoing process throughout development of the DEIS. It began when information from any source was identified as useful for inclusion in the DEIS, either directly or by reference. The information was spot checked using any of several methods: comparison with other information sources, double-checking of measurements and calculations, review of methodology, and consultation with persons having expertise. The intent was to assess the accuracy of others' work without duplicating all of it. Information was used when reviewers were satisfied with its accuracy.

More Specifically:

(1) Construction work-force figures were validated in terms of total employee-years using information from Steckley and Lemons(1980) and SIRAM (1978). The alternative of analyzing different workforce numbers was considered but not analyzed in detail (DEIS p. 43). A program of monitoring impacts (DEIS p. 210), which is currently under development with representatives of local government participating, coupled with the announcement of more refined manpower estimates once construction schedules are better known, is a more realistic approach to this item of uncertainty than is a worst-case analysis.

(2) Hydrogeological information related to the risk of seepage from the Alkali Creek tailing disposal area was validated as follows. The presence of Mancos Shale under Alkali Basin is confirmed by Teto, et. al. (1976). Its poor aquifer characteristics are both expected (as is true for any shale) and confirmed using standard transmissivity tests (QDM, 1980a). In terms of structure, the inability of thick shale formations to transmit fractures through much distance is a well-known fact of structural geology: shales have a low shear strength and tend to deform more as a plastic than as a brittle substance. Thus the existence of "significant fractures" (sic) in the Mancos Shale is not expected. This does not prove their absence, of course, but it does aid in assessing Alkali Basin's suitability for tailing disposal. Seismic surveys in the Basin support this expectation (QDM, 1980a, Vol. 1). (Excavation for the tailing dam's foundation will expose Mancos Shale and offer more information on the presence or absence of "significant fractures", which can be used for modifying disposal area design, as needed, to minimize seepage in an easterly direction toward Roaring Judy Fish Hatchery.)

LETTER 26 (continued)

FOREST SERVICE RESPONSES

Mr. Jimmy Wilkins
March 15, 1982
Page 5

to echo AMAX's assertion that "the likelihood of acid water problems is low." This is a blatant example of the lack of validation of company data. If the Forest Service is incapable of assuring this data is correct and that the formation is indeed totally impervious then a complete worst-case analysis must be done. This must be more than the absurd sentence which appears in the document now: "Should the unlikely worst-case condition of uncontrollable leakage occur, it will be possible to pipe East River water to the fish hatchery from a point upstream of Alkali Creek" (p. 154). A much more critical look should be taken at the entire water quality situation and a broad array of environmental impacts should be displayed in a worst-case analysis should validation of AMAX's assertions be impossible.

These are but two examples -- one social, one environmental -- of what appears to be a lack of effort on the part of the Forest Service to validate information presented to them by the proponent. While we are not suggesting that every detail in the 40,000 pages of information should be checked, certainly data that involves important issues identified by the public and which may have significant environmental consequences should be scrutinized.

Crested Butte Watershed, Water Quality, Wetlands and Wildlife.

One of the most significant environmental impacts raised by the draft EIS is water quality. While AMAX's rhetoric indicates that water quality will be improved by their project, the realities of the situation are vastly different. The draft EIS does a mixed job of analyzing these impacts: in the case of the Crested Butte municipal watershed, where the mine site is located, impacts are fairly well described while the impacts at the Alkali Creek tailing site are seriously minimized.

The major impacts to the Coal Creek watershed (which is the drinking water source for the residents of Crested Butte) are identified on p. 251 of the document. They are: "increased suspended sediment" from mine construction which "will probably tax the already-strained treatment facility used by the Town of Crested Butte," "the risk of accidental chemical or fuel spills" and the risk of acid drainage several decades hence." In addition, on p. 132 the draft states: "Damage to the Coal Creek channel caused by high flows may be aggravated through accelerated abrasion by the additional sediment, which could lead to a more prolonged period of degraded chemical and biological quality. If this were to occur, additional water treatment measures may become necessary for the Town of Crested Butte's water system -- or another source may have to be developed -- in order to insure a safe and adequate water supply."

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26-11

Validation of the assertions regarding water quality was possible.

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Impacts to our water supply which have not been identified in the draft relate to the 3,300 feet of fill to be placed in Coal Creek directly above our municipal intake. They are:

1. There will be a net loss of wetlands in the watershed from fill emplacement which will eliminate a certain amount of purification and flood storage functions now relied upon by the town. As indicated in our testimony at the public hearing, "The value of undisturbed wetlands in our watershed is significant; they provide a water purification and water storage capability to the town at no cost. Our monitoring program has shown that heavy metals such as cadmium are filtered out as Coal Creek meanders through these wetlands; water that contains as much as 3.5 ppbs of cadmium upstream at Elk Creek only shows 0.5 ppbs (a safe drinking water level) by the time it filters through the soils, bogs and our reservoir." The Forest Service should attempt to estimate costs to the town for treatment of heavy metals necessary if this purification function is significantly impaired.
2. The draft does not discuss the composition of the fill to be placed in Coal Creek. Since this is raw material taken from underground there may be significant problems from the leaching of toxic materials similar to acid mine drainage through underground workings. The fill source formations should be analyzed for their heavy metal toxicity and impacts to the creek from the leaching of these toxic materials fully analyzed. Heavy metal loading to the town's water treatment plant should be fully examined.
3. Flooding from spring runoff has always been a problem for the town. Putting 3,300 feet of Coal Creek through a culvert and dropping it 80' will surely increase the velocity of flood waters and may pose a threat to the physical intake structure and even to property in town. This should be fully analyzed.

In addition to a more complete analysis of the impacts from the Coal Creek fill, we believe the Forest Service should do a much more thorough analysis of the impacts from acid mine drainage. Simply identifying the probability of this drainage is not enough. How will underground workings alter the groundwater system in Mt. Emmons? Where is this acid drainage likely to go? Will parts of the Coal Creek watershed be dewatered? Most importantly, how will subsidence affect the amount of the mountain is to become newly-exposed rubble won't this greatly increase the amount of acid flow? Subsidence, groundwater alteration and subsequent acid drainage appear to be the most significant water quality impacts to the town and pose a critical long-term threat to the health and safety of our citizens. These issues should receive much greater attention in the final draft.

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26-12

The purification and flow storage functions of wetlands in the Coal Creek drainage will not be significantly impaired by the Coal Creek crossing: (1) the crossing will bury only a small percentage of the drainage's total wetland area. (2) the valley bottom at the proposed fill location is narrow and steep-sided, with very little space being available for surface spreading (for flood storage and purification) or subsurface storage (for gradual release). Much better bottom conditions for these purposes exist upstream of the fill location. (3) Coal Creek is typically in the flood stage for only a few weeks of each year--during the snowmelt--and its wetlands perform a noticeable purification function only during that limited period. The rest of the year the creek is confined within its banks.

Water quality data in Forest Service (1980d) and CDM (1980v) do not indicate a significant decrease in cadmium concentrations between Elk Creek and the Town's water intake.

26-13

This has been added. See FEIS pp. 12-13.

26-14

Uncontrolled flow through the culvert will, at the most, create a pool at the culvert's outlet. High-velocity flow in the culvert will not continue below the pool. By definition under Alternative 3 in the DEIS, however, the fill will be located to avoid an effect on the Town's water intake. Flow through the culvert will be controlled to permit the passage of aquatic life (AMAX, 1981b, Item 3), and thus increased velocities are not expected. In addition, the placement of energy dissipators at the outlet is a standard measure which can be used to further insure against scouring.

26-15

The risk of acid drainage (DEIS pp. 109-110) was recognized early as a major potential problem. Considerable technical work has been completed to predict its occurrence and identify possible methods of controlling its magnitude. This work is fully discussed in Snow (1981) and Williams (1980a), which are incorporated by reference in the DEIS.

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We also believe the document fails to address the possibility of surges of pollutants entering the watershed from spring runoff around the mine area. Since there are no details on the future configuration of AMAX's water treatment plant and its drainage system, it is difficult for us to analyze the probability of heavy metals entering the system. Given the poor water quality track record at AMAX's Climax mine every spring, if drainage pipes and ponds containing heavy metals will be built in the watershed, contamination of our water supply from overflows and purges is a distinct possibility. The final EIS should address water treatment configuration in detail so impacts can be fully understood.

Although it is clear that there will be a number of significant impacts to the town's water supply the document does not indicate with any degree of certainty how these impacts will be mitigated. The town's position has been very clear: we have made significant financial investments in a water delivery system, we have vested legal rights in this watershed since 1893, we have been a Forest Service permittee since 1963 and we have spent considerable time and money to develop a comprehensive watershed management plan to protect the quality of our drinking water. These investments of time and money are significantly threatened by the development of the AMAX mine yet only a cursory look at mitigation measures has been done and mechanisms for compliance are unclear. Does the Forest Service consider impacts to the watershed to be on-site? Why then are mitigation measures so vague? Why does the Forest Service indicate that they may be required? ("Certain steps could be taken to minimize the impacts discussed above" p. 252 and "The mitigation measures that the Forest Service may require to mitigate impacts that occur on National Forest Service lands..." p. 301, emphasis added.) The general list of mitigation measures on p. 252 does not adequately address the concerns of the town. There is no demonstration that our permit, our water rights and our investments will be protected. Statements such as "Relocate the intake to another watershed" or "Move the intake above the fill" offers little information. What guarantee against further intrusion do we have if we do move our watershed? What will these mitigations cost the town? How will they be implemented? If the Forest Service accepts AMAX's land trade offer without revisions how will our system be protected once it is in AMAX's ownership?

The Town of Crested Butte does not share Forest Service assumptions that mitigation will be in place because of vague statements in the document and the apparent uncertainty regarding the agency's mitigation authority. Until this is clarified in further detail we will assume that the Crested Butte Municipal watershed will be seriously and permanently impacted by the AMAX mine and will therefore continue to oppose the project as currently planned.

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26-16

From AMAX's Plan of Operations (1980a, p. 6):

"Waste water from mine site surface facilities such as boiler scrubber water, vehicle wash water, and area runoff will be routed to a treatment building. This building will house the gravity settler, oil coalescer, clarifier, and sand filters for removal of suspended solids and oil. The clarification plant effluent will either be discharged to Coal Creek or sent to a waste water treatment plant (Lectroclear) if necessary before discharge to Coal Creek. Sludge from the Lectroclear plant will be shipped to the Climax Mine for disposal."

Minewater plus underflow from the gravity settler and clarifier will be fed to six 3,360 cu m (120,000 cu ft) concrete-lined settling basins before being sent either to the Lectroclear plant for further treatment or to the mill for process use. Treated water from the Lectroclear plant will be discharged to Coal Creek."

Discharges to Coal Creek, other than via the existing heavy metals treatment plant, will require an NPDES Permit. This will insure protection of the Town's water supply.

26-17

See Responses 26-7 and 26-8 for a clarification on mitigations.

Specific responses:

- (1) "Does the Forest Service consider impacts to the watershed to be on-site?" Yes
- (2) "Why then are mitigation measures so vague?" At this stage in the process it is not realistic to discuss the site-specific details of mitigation. For example, the detailed schedule of mine site construction will have to be known before detailed requirements on settling basin sizes and locations can be established. The Forest Service has anticipated this by including the first item under Unanticipated Disturbances in Table B-18 (DEIS p. 325).
- (3) "Why does the Forest Service indicate that they may be required?" At this stage in the process it is not known what the Forest Service Record of Decision will require for mitigation. Thus the use of such words as 'could' and 'may'. Public comment will be considered in establishing the mitigations required by the Record of Decision.
- (4) "What guarantee against further intrusion do we have if we do move our watershed?" This depends on the alternate watershed selected and the uncertainty naturally associated with the future, which cannot be assessed at this time.
- (5) "What will these mitigations cost the town?" This cannot be known until cooperative discussion and negotiation take place between the parties involved.
- (6) "How will they be implemented?" See the discussion under Response 26-8.

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Countywide impacts to water quality and to fish and wildlife and their habitats have been minimized by this document despite serious concerns expressed by fish and wildlife management agencies over the past three years. Because the Forest Service accepts AMAX's promises that the construction of a huge mine and mill complex will have virtually no impact on the valley's water quality and wildlife, both the public and agency decisionmakers are led to believe that cumulative impacts on wetlands, aquatic habitat and the fishery resource, elk winter range and calving grounds, bald eagle habitat and the Roaring Judy Fish Hatchery will not occur. This is a gross distortion of the nature and extent of impacts that may be expected.

Gunnison County's renewable economy is heavily dependent on revenues from all kinds of recreation which are in turn dependent on the highest environmental quality. Dispersed recreation activities such as hunting and fishing are especially important to our countywide economy and therefore especially important to protect. (Gunnison County has 742,000 visitor days a year from fishing alone, the second highest use in the entire state.)

Since anticipated impacts to this invaluable resource were identified early in the process, it was determined that the Forest Service would work closely with wildlife agencies and the proponent to fully analyze impacts and develop possible mitigation measures. Rather than discussing in full the conclusions of this cooperative effort, the draft EIS simply includes the statement: "Although baseline studies provided considerable data about present elk use patterns in the Project area, there is disagreement regarding the most likely effects on elk populations of locating the mill and tailing pond in Alkali Basin." (p. 149) The document also dismisses the possibility of impacts on aquatic ecology and never discusses the cumulative impacts of the project on the wetlands of Gunnison County. No discussion of the values of undisturbed wildlife habitat and wetlands is included.

Interestingly, the document gives a hint of the total picture in the land use section of the discussion of the "relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" when it states: "Approximately 3,000-5,000 acres of land will be changed from open space and grazing uses to residential and industrial uses. In the long-term, approximately 400-500 acres will be returned to open space and grazing; 600-1,800 acres will remain in residential and ancillary use; and between 2,000 and 2,700 acres will remain as unreclaimed subsidence area and tailings area." (p. 254)

What does this mean? Although it is not clear how these numbers are put together, what impacts are included (does it include the dewatering of agricultural land from the consumptive use of 3,000 acre feet of water a year?) or the assumptions that were used, these are astounding numbers. Are we really faced with the loss of this much open space, wildlife habitat, and agricultural land? The long-term productivity

26-17 (continued)

(7) "If the Forest Service accepts AMAX's land trade offer without revisions how will our system be protected once it is in AMAX's ownership?" From Forest Service Manual 5430.32 (3)(b):

"National Forest System lands occupied under permits or easements ordinarily should not be exchanged unless the non-federal owner and the permittee reach agreement on the disposition of the existing use."

If agreement cannot be reached and termination of the permit and completion of the exchange is in the public interest, as supported by an environmental assessment, the permit may be terminated and the exchange completed. Termination must comply with the conditions of the permit document and policies governing the termination of permitted uses. Deviations must be approved by the Chief."

26-18

The DEIS does not distort the impacts listed here. The DEIS index lists numerous pages where the impacts listed in this comment are documented. To better display the position of wildlife management agencies, the Fish and Wildlife Coordination Report prepared by the Fish and Wildlife Service has been included in FEIS Appendix K.

26-19

The DEIS and FEIS together describe the impacts on Gunnison County wetlands. These impacts are not considered cumulative with any other wetlands impacts since other impacts can only occur if authorized by the Army Corps of Engineers.

26-20

The relative value of undisturbed wildlife habitat is incorporated into the wildlife impact indices which are used extensively in DEIS Chapter 4. See also DEIS Appendix I. The values of undisturbed wetlands are discussed on FEIS p. 5.

26-21

This section has been rewritten. See FEIS p. 19. These numbers do not include the dewatering of agricultural land since these lands would remain for open space and grazing uses.

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of our land and water resources is in serious question. It is therefore incumbent on the Forest Service to clarify in full detail what the extent of the long-term project impact is and whether this impact is unmitigable or irreversible.

Until such time as a full discussion of the impacts of the AMAX project on wildlife, wetlands and water quality is complete, the situation appears as follows.

The AMAX project is expected to have a number of severe long-term impacts including:

- Subsidence, altered groundwater flows and long-term acid mine drainage from the Mt. Emmons mine which could seriously disrupt not only the drinking water supply of county residents but the aquatic habitat that supports one of the most popular fisheries in the State.
- Wastewater treatment from a rapidly expanding population may create ammonia loads which exceed standards and are toxic to fish. This is already a serious problem (it's identified as such in the draft on p. 109); the addition of AMAX generated population growth may seriously overburden the system. Our population is already beginning to strain our water resource.
- Little proof has been offered that the tailings impoundment system will protect the environment over the long-term. The threat of toxic tailing seepage is still very real but the lack of data validation and design details leaves questions in the reader's mind. Much more groundwater information is necessary for a more complete evaluation of the shale layer. The costs of lining Alkali Basin with clay should be evaluated. The probabilities of dam failure should be fully evaluated with the assistance of the State engineer.

The threat of these industrial processes to the environment and to our local economy cannot be minimized. Our physical and economic well-being depends on a natural balance that can be easily disrupted. We depend on clean water for drinking, for irrigating, for fishing. We depend on our county's wildlife habitat for both economic and spiritual reasons. We depend on undisturbed wetlands to help purify our water and to store flood waters for later use as well as for wildlife habitat. And we depend on an unpolluted environment for the health of our recreational economy.

FOREST SERVICE RESPONSES

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26-22

See Response 26-10, Item 2, regarding validation.

For the purpose of analyzing and comparing seepage risks between the three mill sites and associated tailing disposal areas, the information on Alkali Basin included in and referenced by the EIS is adequate. This information includes: DEIS pp. 60-61, 9293, 153154, 310311, 322, 328330; AMAX (1981a, Sections 4.3.2.3.4, 4.3.6.3.2, 5.4.2.1, 9.4.2); CDM (1980a); and Robinson (1980). Additional details on design, groundwater flow, and foundation stability will be generated as necessary prior to actual construction. Lining Alkali Basin with clay will be considered if additional seepage control measures appear warranted. Prior to construction, dam stability will be evaluated by the State Engineer.

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Because of the undisputed value of an undisturbed ecosystem and because no proof of mitigation of these identified impacts has been offered*, the Town of Crested Butte will recommend to the U.S. Army Corps of Engineers that the 404 wetlands permit for the AMAX Mt. Emons mine be denied and that the U.S. Forest Service deny the land trade because it is not in the "public interest."

Socioeconomic Impacts.

The impacts from rapid population growth have remained among the most serious concerns of the public and appear to be among the most difficult to mitigate. The draft EIS states on p. 124 "The growth created by the Mt. Emons Project, when superimposed onto the growth already expected from the tourist and recreation industry, will strain all community elements in Gunnison County. Population buildup will be rapid." It goes on to briefly identify the possible impacts of difficult social integration and increased social stress, problems with public system financing, adverse fiscal impacts on local economies, inadequate housing and increased demands on local governments. (It must be noted here again that all these impacts are based on an unusually low construction force estimate given to the Forest Service by AMAX which the agency has yet to validate. Because of these low numbers we can most likely expect significantly larger impacts than presented in the draft EIS.)

However, rather than painting a true picture of the impacts on the human environment, the draft EIS attempts to portray a positive social and economic benefit from the project using AMAX rhetoric and then tries to minimize the negative impacts. On p. 214 the document states that the production alternatives "could improve certain deficiencies that already exist, such as limited shopping facilities, low wages, shortage of employment opportunities, and limited indoor recreational facilities." On p. 217 it states: "If the Project is built it will also provide a relatively large amount of stable employment for a few decades. It will provide a basis for enhancing the local economy."

These rosy predictions are being made in a time when AMAX employment in Colorado has dropped by 1/3 in 13 months (a total of 1,910 jobs lost), when the trader price for molybdenum has dropped from \$32/pound in 1979 to below \$4/pound in December 1981, and when new competition

*AMAX has purchased private wetlands for exchange with the Forest Service. The Town of Crested Butte does not consider this an acceptable mitigation measure. There will still be a net loss of wetlands; wetlands in the public domain will still be open to exploration and mining due to an antiquated management policy and thus not fully protected from environmental damage. These lands will also not replace valuable wetlands functions in the Crested Butte municipal watershed.

26-23

The validation of construction workforce estimates is discussed in response 26-10, item (1).

26-24

These discussions have been revised. See "Tradeoff" on FEIS pp. 16-18.

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is providing an even larger chunk of world molybdenum supply. With demand for molybdenum tied to the most troubled sectors of our economy (steel, autos) it is absurd to portray long-term stable employment as a positive benefit. What is more likely is that Gunnison County will suffer the short booms and busts characteristic of the nonferrous metals industry throughout the life of the mine. For as Forbes magazine stated so succinctly, "Those who ignore history are doomed to repeat it. The big metal mining companies keep ignoring it so they keep repeating it." (January 4, 1982)

Although AMAX has consistently minimized socioeconomic impacts on the Town of Crested Butte, we can expect a number of severe impacts. Under the AMAX production alternative our population will double, our fiscal profile will be "continuously deteriorating," and social stress and conflict is expected to be high. Public systems could be severely strained and the draft states, "If systems are not on stream by the time they are needed, it could ironically turn out that in spite of all the warnings, the 'boomtown' syndrome could appear once again." (p. 218)

The draft EIS provides no analytical depth for the communities to understand the magnitude of the problem they face. The entire socioeconomic analysis under "Relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity" states, "Over the short-term, local economic conditions will adjust to the Project's initiation and later to its departure." Well, in the simplest sense we suppose this is true. Crested Butte adjusted to the closure of Big Mine in 1952 but not without severe economic and social dislocation.

We do not share the Forest Service's optimism that "Several factors suggest that closure could be comparatively mild." The reasons given for this optimism are ridiculous: "(1) It is not expected to be abrupt. The end of production will be known several years ahead of time. (2) Layoffs should be minimal. Among AMAX's mitigations in Appendix A is the proposal to reduce the workforce during closure by not filling jobs as they are vacated. (3) Time should be available for community planning. If closure is known several years in advance, local governments will have time to prepare, and this should ease the transition to a post-mine economy." (p. 219)

Let's face it: we're going to have a boom if we have a mine and we're going to have a bust when it shuts down. And we will all be better prepared for it if we understand the magnitude and expected consequences. This is why it has been repeatedly suggested that a worst-case "boomtown syndrome" analysis be done. This continues to be a highly likely scenario given the Forest Service's position of not requiring off-site mitigation of impacts and its reluctance to withhold its permits until all other federal state and local permits are issued (an action which would uphold the spirit of the Colorado Joint Review Process).

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It was impractical to include full analytical details (nearly 1500 pages) from the socioeconomic studies (BML 1980ab, 1981ad) in the DEIS, which is why the material was incorporated by reference. Representatives of the various local governments potentially affected by the Project, and AMAX, participated in the development of BML's studies and received copies of the results. This information is widely available locally.

26-26

The Forest Service acknowledges that there may be differences of opinion in this matter.

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We believe a much more complete analysis of secondary, socioeconomic impacts must be done, including a more realistic assessment of the probabilities of booms and busts given the current state of the national economy. The underlying assumption that mitigation will be in place should be removed from the DEIS since the Forest Service has not shown that local state or other federal agencies have the legal, political or fiscal capability to implement and enforce the mitigation necessary to protect the residents of Gunnison County.

As was shown in the Gunnison County Residents Survey (1979) the people who live here have a great life, they appreciate it, and have no particular desire to leave. Any major disruption of this quality of life will be deeply felt. The Forest Service has an obligation under NEPA and under the spirit of the CRP to fully and completely outline the expected social and economic consequences of this major industrial development. The final document should reflect this obligation.

Other Impacts To Crested Butte.

The draft EIS shows that the Town of Crested Butte will be seriously impacted by the presence of a massive industrial project just three miles up Coal Creek canyon. We have already identified what we believe to be the most serious risks to our citizens: the long-term degradation of our drinking water supply and the boom town syndrome but there are other impacts which must be mentioned.

AIR QUALITY: The air quality of the Town of Crested Butte has already been seriously degraded by the rapid growth we have experienced in the past five years. This has been a difficult situation to remedy because of our high altitude topography, the political difficulties of placing more restrictions on buildings, and the economic difficulties of paving the streets. The Town Council has taken a series of steps to remedy this situation but we are a long way from the clean air we used to enjoy.

We are now faced with the prospect of even more serious degradation of our air from the AMAX Project (p. 205 DEIS). The Forest Service, however, goes into little detail because the State of Colorado has already issued air quality permits. It is therefore assumed that since standards have supposedly been met, there will be little or no impact.

The Forest Service has abandoned a full consideration of air quality impacts essentially claiming the State has already done this for them. This was exactly the situation envisioned when the Town of Crested Butte protested the issuance of any permits before a full and complete analysis was done. (We should also note here that at that time, we registered serious concerns about the issuance of these permits to both the State and the EPA.) Because of a heavy lobbying effort by

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26-27

See Response 26-25.

26-28

The possibility of socioeconomic mitigation failure--and the consequences--are discussed on FEIS pp. 15-17.

26-29

See Response 26-25.

26-30

Air quality impacts were analyzed, both for the alternative mine and mill sites and for differing population levels under the alternative production rates. The source references for these analyses are: CDM (1980a-u, 1981a, 1982a,b), and AMAX (1981a). Provisional issuance of air emission permits by the Colorado Department of Health indicates an expectation that point-source standards will be met (DEIS pp. 133, 155). Review by EPA indicated that neither mine nor mill is considered a major emitting facility for PSD purposes (DEIS p. 110), and further that emissions from the two sources are not expected to mingle. Modeling of air quality from secondary sources indicates the possibility of local air quality problems regardless of production rate, including No Action (DEIS pp. 203-209). This modeling was conducted in consultation with the Forest Service and the Colorado Department of Health. Forest Service review of impacts on air quality-related values indicated that no adverse impacts are anticipated (DEIS pp. 110-112). A similar conclusion on visibility impairment has been reached by EPA (DEIS p. 111).

Also, see Letter 1 (second paragraph).

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AMAX to get the mine and mill considered as separate emissions sources, no PSD permit was required by EPA and therefore a cumulative and comprehensive review of air quality was never done.

This should have happened in the DEIS. The Forest Service does not give up its responsibility for a full review of all environmental impacts simply because another level of government's review is complete. The Forest Service should take a hard look at the county-wide impacts from two coal burning power plants, large amounts of fugitive dust from construction, pollution from exhaust ventilation systems, the accompanying residential developments (fireplaces, etc.) and automobile exhaust from the huge population influx. Only in this way will we have a clear picture of the air quality degradation that can be expected.

HISTORIC: The Forest Service on page 114 of the DEIS summarizes its position on the potential impacts of the AMAX proposal on the Crested Butte National Historic District by stating:

"In summary, the Mt. Emmons Project will have no adverse effect on the Crested Butte National Historic District since it continues the mining traditions the District was designated to represent."

This summary conclusion is absurd as well as faulty. The scale and magnitude of modern mining makes meaningful comparisons with historic operations a strain on common sense. To contend that huge, automated, industrial mining operations simply continue the traditions embodied in the Crested Butte National Historic District is a ridiculous comparison, like comparing Lake Powell to a stock watering pond. It also misinterprets the significance of the Historic District, whose designation honors not only its mining traditions, but its living sense of independence, uniqueness and community. It is these attributes, established and nurtured in the relative isolation of the East River Valley, which will be adversely affected by the proposed development.

Crested Butte has never been perceived as a museum-piece, but rather as a "living link with the past", where new generations might work out their destinies immersed in the tranquility and grandeur of the mountains. In this light the Historic District is highly dependent on its setting; its significance is hardly confined to its fine examples of frontier architecture. This crucial interplay is recognized by the National Historic Preservation Act, and is further embodied in the regulations and guidelines of the Advisory Council on Historic Preservation. Of particular importance are the criteria for determining and evaluating adverse effects on historic properties, even if delayed in time. Subsections (b) and (c) of Section 800.3 of 36 CFR state..."Generally, adverse effects occur under conditions which include but are not limited to: (b) isolation from or alteration of (a property's) surrounding environment; (c) introduction of visual, audible, or atmospheric elements

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26-31

There is no evidence that a mining operation of larger scale and magnitude than previous operations, particularly if located over 3 miles away and not visible from the town, can adversely affect the Crested Butte Historic District.

While the proposed bypass road may pass through the city limits of Crested Butte, it does not pass through the Historic District as described in Baker, et. al., 1981.

Regarding noise impacts see Response 23-33 and 23-34.

The development of incompatible land uses can occur only if the responsible authorities, Gunnison County and the Town of Crested Butte, approve them.

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that are out of character with the property or alter its setting."

It is the Forest Service's contention that there will be no adverse impacts on the Crested Butte National Historic District occasioned by AMAX's proposal. We disagree with this contention. Despite the Forest Service's summary dismissal of noise, visual and growth pressures on the district, those of us living here have already experienced significant adverse impacts in these areas resulting from the exploration phase of the AMAX Project. Specifically we experienced increased noise from trucks and blasting, which was highly disconcerting, and we can expect this to increase dramatically with mine construction and operation. The proposed by-pass road will not mitigate this impact. Situated against the natural sound amplifier of Gibson Ridge it will exacerbate, rather than lessen, the noise intrusion. The by-pass also crosses a corner of the Historic District, and while not destroying any physical buildings, the noise will be funneled at the entrance of the Coal Creek canyon back into a residential portion of the district. Other noises (especially from the mine exhaust system) coming down Coal Creek canyon will be audible in town and substantially higher than the claimed background noise.

Visually, there will be subsidence and rubblization on the upper reaches of Red Lady (Mt. Emmons) which forms the most prominent natural backdrop to the Historic District. Such disturbance will noticeably and irrevocably alter the setting of the district.

Project induced growth pressures on private lands surrounding the Historic District can be expected to create land uses incompatible with the open space and setting which makes the Crested Butte Historic District such a unique and outstanding national asset.

In summary, the town feels that there will be significant adverse impacts both direct and indirect to the Crested Butte Historic District, and that these impacts are neither addressed, analyzed, nor mitigated in the Forest Service's Draft Environmental Impact Statement.

"QUALITY OF LIFE": The noise and visual elements identified above will also directly impact the quality of life the residents in the Town of Crested Butte now enjoy. Although the draft dismisses this phrase "quality of life" as essentially unquantifiable (p. 214) it is clear that various components of this elusive term can be measured and analyzed. The roar from the mine and its accompanying traffic, the collapse of Red Lady Basin, the visual blight of powerlines stretched through Horse Ranch Park and our scenic valleys, the sprawl of trailer courts, traffic congestion on Highway 135 -- all impact our daily lives. This impact should be recognized by the Forest Service.

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26-32

These components were analyzed in the DEIS under the topics Noise, Subsidence, Visual Resources, Housing, and Transportation. Other topics could be added to these components: Outdoor Recreation, Social Impact (DEIS p. 125), Social Effects (DEIS p. 213), Social Structure, Growth Impacts, and Agriculture. It was the integration of these factors into the single, subjective concept of 'quality of life' that was declared unmeasurable.

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TRANSPORTATION: The DEIS barely addresses the complexities of providing a mass transit system for thousands of people but simply states that upgrading of the bus system will mitigate this problem. This is yet another example of how the Forest Service dismisses complex problems by a simple assumption that some other agency will handle it. Designing and running a mass transit system is time consuming and expensive. It has taken years for the upper East River Valley to establish a workable system; the large expansion necessary to accommodate the AMAX work force will not be an easy task. To assume it will happen is illogical.

The Forest Service/AMAX Land Trade: Is It In The "Public Interest?"

Two major conclusions can be drawn from the draft environmental impact statement. First, the AMAX Mt. Emmons Project will have serious impacts on the human and natural environments of Gunnison County, over both the short and long-term. Second, current Forest Service policymakers and attorneys have relinquished their authority over the public lands to mining companies by an antiquated interpretation of the 1872 Mining Law and have refused to take any responsibility for mitigation requirements for damage to private lands and investments. Opportunities for environmental protection appear minimal.

There are, however, several areas in which the Forest Service admits it has discretion to deny "permits". These discretionary actions -- such as land trades and easements -- are governed by the public interest doctrine set forth in the Federal Land Management and Policy Act (1976). In this legislation, requirements for the management of public lands under jurisdiction of both the Department of Interior (BLM) and Department of Agriculture (USFS) are outlined. Section 302(b) specifically states: "Except as provided...in the last sentence of this paragraph no provision of this section or any other section of this Act shall in any way amend the Mining Law of 1872." The last sentence of the paragraph states, "In managing the public lands the Secretary shall, by regulation or otherwise, take any action necessary to prevent unnecessary or undue degradation of the lands." The language of FLPMA thus expressly amends the 1872 Mining Law by making the public interest the paramount consideration.

The section in FLPMA on Exchanges (Sec. 206(a)) also states, "where the Secretary concerned determines the public interest will be well served by making that exchange." It is thus made very clear by Congress that a public interest determination must be made by the federal land manager when considering a land exchange with a private interest. (This issue is number 19 on p. 376.)

FOREST SERVICE RESPONSES

26-33

The DEIS does not assure a bus system will happen. The impacts of using individual vehicles are also displayed. The CEO has said that all relevant, reasonable mitigation measures that could improve the Project are to be identified. This serves to alert agencies or officials who can implement these extra measures (CEO, 1981).

LETTER 26 (continued)

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Although the issue of how the EIS and land trade are analyzed and how they relate to the Forest Service decisionmaking process has been raised repeatedly, the draft EIS offers little information to show exactly what the "public interest" is. The only choice offered the reader is to proceed with analysis of AMAX's land exchange offer or to terminate the process. The former, the DEIS tells us, "will lead to more intensive analysis of exchange alternatives in terms of the public interest." Thus, at some vague time in the future the Forest Service will make its public interest determination; sometime presumably well after the Record of Decision to approve the Mt. Emmons Project and its necessary land trade has been filed. At this point, the exchange is merely the exercise of comparing resources and determining "equal value". The public interest has been lost somewhere in the shuffle.

This DEIS should have rigorously analyzed the merits of the proposed land exchange and should have displayed the consequences of proceeding with the exchange. Instead, we are presented with the following:

"All of the information required for further analysis is not available at this time, but in order to provide a basis for public comment on the nature of subsequent analysis, this appendix describes some of the alternatives that may be considered." (p. 365)

Important decision points are thus being passed without a full and rigorous analysis. On p. 36 the draft states: "It is assumed that a decision to proceed with the land exchange will require the Forest Service to...approve the proposed land classification described in Appendix E." And on p. 363 (Land Classification Details) the DEIS states: "The Forest Supervisors of the National Forests involved have decided to recommend that the current classifications on their Forests be modified because of changes in land management situations and based on the long-term public interest."

Here is a situation which defies logic. On the one hand, not enough information is available to indicate whether this land trade is in the public interest; on the other hand the Forest Supervisors have decided that reclassifying this land to make it available for trade is in the "long-term public interest." This decision has not been documented; the process moves inexorably along.

Does the Forest Service actually believe that by disposing of large quantities of public land for an operation that will have serious long-term environmental consequences that the "optimum ownership pattern" for Red Lady and Alkali Basins will be achieved? We believe the Forest Service is violating its own rules which state that "classification planning should reflect the ownership determined to be in the public interest in the long-run and should not be limited by current adjustment possibilities." (p. 364) because the draft then goes on to state "The primary document used to indicate a need for changes in management direction and land classification is AMAX's Plan of Operations.";

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Although it should be quite clear from even the minimal information contained in the draft, that the disposal of valuable public lands containing wetlands, wildlife habitat, water resources, range, research, recreational values, and public access to public lands is not in the public interest, the Forest Service has allowed its legal interpretation of AMAX's millsite patent rights to interfere with its analysis. Because the agency feels it should exchange valuable national resources will be turned over to private interests, public management of these lands will cease, ("If federal lands are exchanged, they will no longer be subject to Forest Service regulations. As a result, some Project activities will no longer be subject to NEPA analysis." p. 36) mitigation requirements will be unenforceable and severe environmental damage will ensue.

We believe the best course is for the Forest Service to choose the third alternative identified: "Do not accept AMAX's offer," retain the land in public ownership and allow AMAX to obtain whatever rights they believe they have under the 1872 Mining Law on their own. If this weakens their case for investment, (p. 37) or if they cannot obtain as much land as they believe necessary, so be it. Only by retaining lands in public ownership will the mitigation required be enforceable, will continued compliance with NEPA be required and will the long-term public interest be served. If AMAX cannot meet these requirements, cannot obtain credit, then the long-term public interest will be even better served -- the mine will not be built at public expense.

The Need For the AMAX Molybdenum Mine.

"The nation's nonferrous mining industry has just completed a calamitous year, and 1982 may be no better. Producers agree that a business turnaround is impossible until the U.S. economy recovers. And even then, with diminishing markets and overcapacity plaguing almost all products, its condition will be far from robust. The recession of 1981-82 may have wreaked permanent damage on non-ferrous producers; some may not survive.

"The basic problem is that nonferrous metals -- copper, aluminum, molybdenum, lead, zinc and nickel -- are tied to the most troubled sectors of the economy." (Business Week, January 11, 1982)

34

26-34

The DEIS does not state, as the quotes in this comment recognize, that public management of selected lands will cease. Any lands acquired by AMAX, while no longer under Forest Service Regulation, are still subject to many other County, State and Federal regulations. DEIS Table 1-1, p. 4-5, list up to 26 other public approvals that AMAX may be subject to regardless of Forest Service authority.

LETTER 26 (continued)

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The fortunes of the metals industry have always been closely tied to trends in the national economic picture. In the true free market spirit, the molybdenum market responded to increased demand in the late 1970's with a crash exploration program and increased production capacity. However, with key industrial sectors like steel and automobiles close to depression and with slackened worldwide industrial output, demand for molybdenum products has dropped sharply in the past year. New capacity (new primary molybdenum mines and increased by-product production from copper mines) has cut deeply into AMAX's market share.

Moreover, AMAX has begun to suffer the effects of an aggressive expansion and diversification policy. Forbes, January 4, 1982 says: "AMAX, the free world's largest producer of molybdenum, has been diversifying, but the cost has left it loaded with 50% in variable rate debt. Interest costs alone last year were an estimated \$180 million -- while the prices of molybdenum and other metals were sinking fast." Forbes also includes some interesting numbers on the current costs of such an aggressive expansion policy: "A new copper or molybdenum mine costs nearly \$2 billion to develop these days. Think of it: you need a gross profit of \$300 million a year just to cover the interest on a billion dollars." AMAX's gross profits in 1981 were \$230 million.

It has been clear for some time that the Mt. Emmons Project is extremely speculative. The company likes to point out that it has invested \$115 million in this project (which seems like a lot of money to most of us) as proof of its good intentions but compare that cost with the annual interest necessary to capitalize a molybdenum mine.

Stockholders are edgy, the economy is in a deep and prolonged recession, investor confidence is close to a five year low. Long-term demand for the product is being reduced by new materials and depressed growth in the energy sector.

At this point, any company commitment to a 1984 construction startup is therefore deceptive, designed to encourage continued public review. Why are we doing this? Why are we spending significant public time and money to review a project whose variable fortunes place it far into the future?

We are doing it because the major permitting agency, the Forest Service, continues to treat it as a viable project. The great irony here is that this agency's review shouldn't even be taking place until a "valuable mineral deposit" determination has been made. Administrative reviews have led to the interpretation that any deposit should be "presently profitably marketable." This is certainly not the case with the Mt. Emmons Project now but the Forest Service has refused to make the determination required by the 1872 Mining Law they normally observe so strictly; so the entire process lurches forward with no demonstration

FOREST SERVICE RESPONSES

26-35

AMAX's applications to the Forest Service (Plan of Operations, easements for transmission lines and rail haulage, and land exchange) have not been withdrawn. Processing therefore continues.

26-36

"A claimant to an unpatented mining claim is entitled to uses of the surface that are reasonably necessary to the accomplishment of bona fide prospecting exploration, mining, and processing of locatable minerals." (Forest Service Manual 2818).

If and when AMAX applies for patent to the Mt. Emmons deposit, a determination regarding its status as a valuable mineral deposit will be made.

LETTER 26 (continued)

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of need or economical feasibility.

The DEIS even goes so far to say that the Mt. Emmons ore body "will add to the available domestic supply of the metal. This added supply will contribute positively to the national economy and social well-being." (p. 256)

No one, not even the proponent, believes this at this time. The Forest Service is doing the public a great disservice by echoing the empty rhetoric by which AMAX hopes to keep the permit process moving. A critical and realistic assessment must be made of the validity of AMAX's permit application.

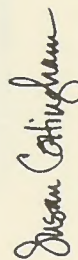
Meanwhile although AMAX doesn't need it, the Forest Service is putting great effort into approving a plan of operations that will lead to serious, often irreversible long-term environmental damage. Subsidence, acid mine drainage, toxic tailings seepage, up to thousands of acres of unreclaimed land, permanent loss of wildlife habitat, major landform changes and the permanent commitment of hundreds of acres of land for housing, powerlines -- are all seemingly unmitigatable impacts that Gunnison County can expect over the long-term.

To allow this severe environmental degradation to happen when no one needs the mine and few want it is an abandonment of public land management responsibilities.

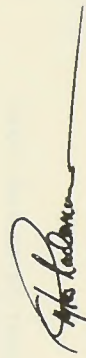
The only remedy is for the Forest Service to abandon not its public trust but its increasingly unresponsive and outdated policies, admit the AMAX Project is an essentially unmitigatable environmental disaster and refuse to issue the necessary permits.

We're not suggesting this would be an easy decision. But it's the only way, from our point of view, that the public interest will be served by the agency entrusted with the care of our infinitely valuable public lands.

Respectfully submitted,



Susan Cottingham
Planning Director
for the Town of Crested Butte



Myles C. Rademan
Community Development Director

LETTER 26 (continued)

RESOLUTION NO. 1

SERIES 1982

A RESOLUTION COMMENTING ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT OF THE AMAX MT. EMMONS MINING PROJECT.

Recitals:

Whereas: 1) The Town of Crested Butte, since 1977, has monitored and evaluated potential impacts of the proposed AMAX Mt. Emmons mining project, and

2) In adopting Resolution No. 2, Series 1979 and in subsequent affirmations, the Town Council has opposed the Mt. Emmons project as proposed until its adverse impacts were mitigated or a commitment is made to mitigate such impacts and its benefit to the Nation shown, and

3) The United States Forest Service's draft Environmental Impact Statement indicates significant, negative impacts to the economic and environmental well-being of the citizens of the Town of Crested Butte, and

4) Forest Service policy does not require AMAX to mitigate negative impacts of its project on private land and AMAX has not proposed mitigation of adverse impacts satisfactory to the Town, including those activities that pose a threat to the Town's water supply, and

5) AMAX does not intend to develop this project until economic conditions improve, there being no current national need for additional molybdenum production.

NOW THEREFORE BE IT RESOLVED BY THE TOWN COUNCIL OF CRESTED BUTTE, COLORADO THAT 1) DEVELOPMENT OF THE AMAX MT. EMMONS PROJECT SHOULD BE PROCEED AS PROPOSED, 2) THAT ANY ADVERSE IMPACTS TO THE TOWN SHOULD BE MITIGATED PRIOR TO FOREST SERVICE ACTION ON ANY PERMIT REQUESTS BY AMAX AND 3) THAT THE TOWN HEREBY ENDORSES THE NO ACTION ALTERNATIVE AS THE ALTERNATIVE THAT, AT THIS TIME, BEST SERVES THE NEEDS OF OUR CITIZENRY.

ADOPTED THIS 1ST DAY OF MARCH, 1982.

(SEAL)

TOWN OF CRESTED BUTTE, COLORADO

By Joyce Valley
Joyce Valley Town Clerk

By Thomas S. Cox
Thomas S. Cox, Mayor

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INDIVIDUALS

1. Don Bachman
2. Alison Barnes
3. Billy Barr
4. Dan Batchelor
5. Paulette Bierzychudek
6. Kevin D. Black
7. H. S. Boyne
8. R.K. Brenimer
9. Ellen Brunder
10. Nicholas Brunder
11. Ed Calvert
12. Hazel Chapman
13. Irvin Chapman
14. Theo Colborn
15. Karen Conroe
16. Michael Cooper
17. Dr. Robert K. Enders
18. Max T. Evans
19. Larrie Jean Ferguson
20. Wallace D. Foster
21. Michael Ray George
22. John S. Gilmore
23. Steven Glazer
24. Dexter Guerrieri
25. John H. Hahn
26. Linda D. Helken
27. Dennis B. Hall
28. Fred Harmon
29. Eric Holle
30. Jeffrey C. Howry PH. D.
31. David W. Inouye
32. Dennis Johns
33. John C. Johnson
34. Paul & Cindy Kaplan
35. Richard Kaufman
36. Tom C. Kelley
37. Steve Kershaw
38. Caroline Klingsmith
39. John W. Krezmanich
40. Peggy Kuhn
41. Vince LaCapra
42. Alex Laird
43. Mary Jo Laird
44. James L. Larz R. N.
45. Mary Clark Ley
46. Mary Beth Light
47. Wes Light
48. Glenn R. Lord
49. Anthony Muller
50. Ceil Murray
51. John Newberry
52. Jane Ordway
53. Mark Pearson
54. Lisa Peger
55. Dr. Mary V. Price
56. Elizabeth H. Rader
57. John Roberts
58. Eric Ross
59. Tim Ross
60. Robert J. Rozman
61. Nancy Ruehle
62. Andell Sawdo
63. Brenda Smith
64. Roy Smith
65. Steve Smith
66. Lee Spann
67. Gary Sprung
68. John & Pauline Stajduhar
69. D.P. (Mike) Svilar
70. Larry Tanning
71. Jane Taylor
72. Martin Tezak
73. Henry Truebe
74. Alva Uhl
75. Rocky Warren
76. Dr. Nicholas M. Waser
77. Dr. Ruth L. Willey
78. Klaus Wisiol

Note: Two hundred signatures on petitions in support of the Mt. Emmons Project and stating that it would be "beneficial to the area" have not been included in this list as there was no response needed.

List of Commenting Organizations

- | | |
|---|--|
| 79. AMAX, Inc.
Arthur T. Biddle
Mike Rock | 88. Gruen Associates
Ki Suh Park |
| 80. American Wilderness
Alliance
Jeff Rennie | 89. Gunnison County Chamber
of Commerce
Wyatt B. Angelo |
| 81. Aspen Wilderness Workshop
Judith Lowe | 90. Gunnison County Electric
Association
James Somrak |
| 82. Boulder Audubon Society
Lyn dePachter | 91. High Country Citizens'
Alliance
Don Bachman
Wesley A. Light |
| 83. Colorado Institute for
Human Development
Caly Bridgford | 92. National Audubon Society
Robert K. Turner |
| 84. Colorado Mountain Club
Ann Vickey | 93. National Wildlife
Federation
Roy Parker Robert Golten |
| 85. Colorado Open Space
Council
Barbara Lewis | 94. NUPEC Resources, Inc.
Ed Calvert |
| 86. Colorado Wildlife
Federation
Jim Hefferman | 95. Sierra Club Legal Defense
Fund, Inc.
William S. Curtiss |
| 87. Friends of the Earth
Edward M. Dobson | |

VEGETATION

Comment 1: What is the probability of success for high altitude reclamation? (91)

Response: Techniques have been developed which make the probability of successful reclamation high. However, one should note that the DEIS p. 254 records that the highest elevation of project disturbance, the subsidence area, will not be reclaimed. This discussion has been modified. See FEIS p. 19.

Comment 2: The DEIS should recognize that there are significant legal and technical problems with implementing the mitigation measure that would artificially maintain the contaminated water supply to the Mt. Emmons Iron Bog. Therefore, the potential impact on the Iron Bog should be added to the potential irreversible, irretrievable commitments. (79)

Response: The problems mentioned in this comment are recognized on DEIS p. 102. FEIS p. 19 includes the probable loss of the Iron Bog under the irreversible, irretrievable commitments.

Comment 3: One cannot determine how it would even be feasible to reclaim "with the vegetation types disturbed" (DEIS p. 302). (50)

Response: There was an error in the text which has been corrected in the FEIS. The word "types" is replaced by the word "forms". Thus, grassland, will be reclaimed with grasses, shrubland with shrubs and forest land with trees.

Comment 4: The statement that "no threatened or endangered plant species occur on the Gunnison National Forest" is questionable because a representative of Rocky Mountain Biological Laboratory believes that there are endangered species of *Zygogonium* to be considered. In addition, there are two very small endangered populations of *Astragalus microcymbus* in the area of Chance Gulch. (50)

Response: Neither the Fish and Wildlife Service nor the State of Colorado recognize *Zygogonium* as an endangered species.

Even though Chance Gulch is not on the Gunnison National Forest, a Forest Service Botanist visited the site and observed that the preferred habitat for *Astragalus microcymbus* does not occur in Chance Gulch and that the known and recorded populations of this plant would not be affected by Alternative 7, which includes the Chance Gulch millsite.

Note: The numbers in parentheses at the end of each comment identify the comment's source. They relate to the numbers on the preceding two pages. For example the (91) following comment number 1 above means that High Country Citizens Alliance Submitted this comment.

WILDLIFE

Comment 5: The DEIS ignores the "sphere of influence factors." It should recognize that the 160 elk that are displaced will move to another area and compete with another established herd for severely limited winter range. This will multiply the effects, off-site and could have major implications for the wildlife of the area. (80)

Response: This comment correctly describes part of the scenario used to develop the worst-case analysis on DEIS p. 151. The scenario used, however, goes one step further and assumes that proper herd management would reduce the excess numbers through hunting. In the worst-case all available winter range is stocked to capacity so the basin herds would be reduced by 160 elk.

Comment 6: There is a considerable amount of information regarding effects on the physical environment which are not mentioned in the DEIS. (Example: the extensive big game studies which have been conducted). (79)

Response: DEIS p. 50 specifically refers the reader to the Colorado Cooperative Wildlife Research Unit reports for detailed information on wildlife. These reports document the extensive big game studies conducted for this project. These studies describe baseline deer and elk populations and how they use the environment, but do not contain facts describing effects of the proposed project or its alternatives.

Comment 7: What will be the impact to Bald Eagles caused by the projected removal (Alternatives 2-4) of their feeding habitat. (15,56,71,91)

Response: While DEIS p. 152 notes the possibility of affecting eagle feeding habitat, there is no record of the eagles actually using Alkali Basin. The primary food supply, as noted, appears to be the Roaring Judy Fish Hatchery. The Fish and Wildlife Service has concurred that there will be no affect on threatened or endangered species. See FEIS Appendix K.

Comment 8: It is incorrect to say the wildlife habitat would be lost for 30 to 50 years. (79)

Response: The DEIS discussion is appropriate and consistent with the methodology assumption (6) in DEIS Appendix I.

Comment 9: The DEIS presents no basis for maintaining a one mile buffer between elk calving areas and construction activities during the calving period. Also lacking is a location of the calving areas. (79)

Response: Research on the response of elk to disturbances that are similar to construction activity suggest that elk prefer to keep between 0.5 and 2 miles minimum distance from such disturbances (Ward, 1976 and Lyon, 1975). The Forest Service believes that, considering the importance of calving to the elk life cycle, one mile is a reasonable protective distance within the range of observations presented above. It is also important to note that this mitigation measure only applies between May 15 and June 15 each year.

The Forest Service recognizes that calving areas are somewhat nebulous. However, calving habitat has been defined in the literature (Thomas, 1979) and the intensive radiotelemetry studies conducted for the Mt. Emmons Project by the Colorado Cooperative Wildlife Research Unit (3/79 to 3/81) have helped to define these areas. A map of major elk calving areas is included in AMAX (1981a, Figure A-12) which is incorporated by reference. Until better information is available, this map is a reasonable basis for applying this mitigation measure.

WILDLIFE (Continued)

Comment 10: The DEIS elk impact analyses assume a distinct herd exists in the Flat Top-Red Mountain area. This assumption is invalid since Kevin Wright, the graduate student conducting the big game monitoring studies, reported elk movements out of and into this area. (86)

Response: These movements were considered in structuring the analysis of impacts on elk. It was these movements which negate any arguments of genetic distinction of the Red Mountain herd. However, these movements between herds are infrequent and animals that left the Red Mountain herd often returned at a later time. Therefore the assumption of a distinct herd is reasonable.

Comment 11: Before Alternative 7 can be considered it is necessary to determine the short- and long-term effects on wildlife values of obtaining the clay lining. (86)

Response: The area of disturbance is noted on DEIS p. 185. The DEIS also notes that the exact size and location have not been determined. In terms of the comparison of wildlife impact indexes (DEIS p. 29), adding the area disturbed for clay would only cause Chance Gulch to show the greatest impact by a slightly higher value. In other words, the impact ranking of Alternative 7, relative to the other alternatives, would not change.

AQUATIC ECOLOGY

Comment 12: What are the impacts to aquatic ecology expected under abnormal conditions, and how often can abnormal conditions be expected? (91)

Response: DEIS p. 131 describes the possible impacts under a worst-case analysis. See FEIS p. 11 for a discussion of the probability for the worst-case.

Comment 13: What effect will water use from the East River have on the river's aquatic systems, especially during periods when the water volume is low? (3,63,83)

Response: FEIS p. 8 expands the discussion of water consumption. This discussion includes a worst-case analysis and explains why the probability of its occurrence is low. This same discussion would apply to effects on aquatic ecology.

ENERGY

Comment 14: Neither the availability nor the amount of electrical power necessary for the Project has been addressed. (17,44,53,54,65,82,85)

Response: Power availability is discussed on DEIS pp. 345 and 349. That information is updated on FEIS Appendix D. The Project's electrical requirements are discussed on DEIS p. 202.

Comment 15: As an added incentive for energy conservation in all phases of the project, the "declining block rate" should be eliminated from the electrical power rate structure. (32,40)

Response: Effective January 15, 1982 Gunnison County Electric Association terminated declining block rates and now applies a conservation rate which charges a flat rate per kwh of consumption.

WATER

Comment 16: Why the need for a Carbon Creek reservoir? Why hasn't anyone suggested drilling wells for potable water? (34)

Response: Streams in the Project area are already over appropriated, and this precludes year-round pumping. Reservoir storage is thus necessary.

Comment 17: What are the probabilities of worst case events in the Crested Butte Municipal Watershed, and what are the health hazards which may result from identified watershed impacts? (91)

Response: The probability is low. Turbidity increases will not ordinarily endanger public health. Toxic spills and acid drainage obviously pose more serious threats.

Comment 18: What are the projected impacts to groundwater quality and quantity in the Coal Creek drainage from project activities? (91)

Response: Impacts on groundwater quality are discussed under Acid Drainage (DEIS pp. 109-110). Effects on groundwater quantity were not discussed because no significant impacts are anticipated.

Comment 19: Where will the Project obtain water during dry years? (62,26)

Response: This is discussed on DEIS p. 110, FEIS p. 8, and in Response 11-20.

Comment 20: Baseline water quality of Coal Creek has not been addressed appropriately. The assessment of water quality has been poorly planned and has been executed in an unscientific, haphazard manner. No analyses have been conducted to relate existing data to physical and chemical processes in Coal Creek or its watershed. (7)

Response: Environmental baseline studies were initiated in 1978 following review of AMAX's study proposals by the Forest Service, Colorado State Agencies, a technical review committee sponsored by Gunnison County, and other local governments. Several other organizations with technical expertise reviewed the study plans as well. Comments based on these reviews were taken into consideration and the plans modified as appropriate. Subsequent modifications were also made according to input that was received.

Comment 21: It should be noted that the heavy metals treatment plant has improved water quality in the lower reaches of Coal Creek to the extent that a fishery now exists. (79)

Response: The text has been amended to include this fact. See FEIS p. 8.

Comment 22: In reference to the suggestion on DEIS p. 163 of "Keeping the (ore haulage) drainage system's waters separate from natural drainages", it would be technically and economically impractical to keep the entire ore haulage drainage system separate from natural drainages. (79)

Response: Agreed, the suggestion is over-simplified. The corresponding mitigation measure for it is more reasonable, however. It is the fourth one from the top of DEIS p. 311 and specifies the conditions under which artificial drainages can be reconnected to natural ones.

Comment 23: Not all of the 3,000 acre-feet consumed annually are irreversibly and irretrievably lost, as indicated on DEIS p. 255. Most of it remains in the hydrologic cycle. (79)

Response: Agreed, but as a practical matter the evaporated water cannot be retrieved by local water users.

AIR

Comment 24: Air quality analysis is omitted because the State of Colorado has already granted an emission permit. The State's action does not negate the Forest Service's duty to analyze this environmental impact under NEPA. (33,44,54,82,85,91)

Response: See Response 26-30.

Comment 25: The impacts on acid rain of burning coal to provide electricity for the Project should be discussed. (3,32)

Response: This is included in the discussion of Cumulative Impacts on DEIS p. 256.

Comment 26: The DEIS does not consider the air quality impacts resulting from burning coal at a major generating facility to provide the electricity needed by the Project. (3,32,84)

Response: This is included in the discussion of Cumulative Impacts on DEIS p. 256.

Comment 27: Will citizens be warned before AMAX burns slash during construction? (40)

Response: This is included under the mitigation measure of regularly announcing upcoming activities. See DEIS p. 325.

Comment 28: The DEIS fails to indicate the background levels of total suspended particulates in the Project area. (79)

Response: This information is quite lengthy. Therefore it has been incorporated by reference in CDM (1980s,t Appendix D), which is available in the microfiche system discussed on DEIS pp. 6-7.

Comment 29: Diesel-electric haulage to Chance Gulch would have greater impact on air quality than the DEIS indicates. The emissions would contribute to particulate loadings and introduce a highly visible source of pollution into the scenic East River Valley. (79)

Response: Not at 12 trips per day. Also, this alternative used the Ohio Creek Valley, not the East River.

Comment 30: The methodology for analyzing air quality impacts from secondary sources is not discussed. Such a discussion would indicate that extremely conservative assumptions underlie the analyses. (79)

Response: The methodology discussion is quite lengthy and is referenced through Appendix I CDM (1981 a). The conservative nature of the underlying assumptions is acknowledged in part on DEIS p. 205.

NOISE

Comment 31: Mine site noise impacts are analyzed using a flat earth methodology that fails to account for echoing or channelizing in the Coal Creek Canyon, or for ducting due to winter temperature inversions. There is no validation of theoretical calculations by comparison with actual noise levels at the Keystone Mine or Henderson. Further, the qualitative impact of low level, or background, industrial noises in a quiet area is ignored. (91)

Response: EPA review concurs with the Forest Service that the analysis of noise impacts on cities and towns described in Mirabelli (1980) is adequate.

CULTURAL RESOURCES

Comment 32: When cultural resources are discussed on DEIS p. 253 the discussion should include avoidance as a mitigation. (79)

Response: This discussion focuses on sites that will be affected. Avoidance is not appropriate for this discussion.

Comment 33: The FEIS should indicate the extent of surveyed lands for which National Register properties were considered. (30)

Response: The cultural resource reports in the microfiche reference system give complete details of surveyed lands. The surveys and National Register considerations included Federal, State and private lands.

Comment 34: Consideration should be given to the historic significance of the Keystone Mine site and related facilities. (30)

Response: The Forest Service will attempt to complete its historic files on this site. Preliminary information, however, indicates that the oldest structures remaining on the site apparently were built about 1955.

VISUAL RESOURCES

Comment 35: Won't reversion of the subsidence area to a natural appearance take as long as a million years? (67)

Response: This is possible, but our ability to quantify the subject is a poorly-developed science.

Comment 36: The rating of visual impacts, DEIS p. 31, is limited to towns and major travel routes and does not mention impacts on the Coal Creek Wilderness Resort. (88)

Response: The discussion on page 31 is a capsulized comparison which by its nature cannot include all of the impacts discussed in Chapter 4. See the response to a similar comment under Land Uses.

Comment 37: In the preparation of visual quality objectives, DEIS pp. 66-67, no consideration is given to establishing those objectives with respect to the Coal Creek Wilderness Resort and its vicinity. (88)

Response: It should be noted that the visual quality objective identified for the Kebler Pass area (retention) is the most restrictive that could be applied unless a classified area of National importance was involved.

OUTDOOR RECREATION

Comment 38: Many impacts on the quality of recreational experience are ignored. What about the skiers at Mt. Crested Butte and wilderness users? How will their experience change? (91)

Response: Portions of the Project will be visible from Crested Butte Ski Area and from the West Elk Wilderness. Viewers from these locations will not be significantly impacted by the Project.

Comment 39: The FEIS should discuss mitigation measures, including limiting use, for protecting the West Elk Wilderness from increasing use that will be caused by the Mt. Emmons Project. (84)

Response: As stated on DEIS p. 116, this impact is expected to be minor compared to the use-related impacts generated by visitors to Gunnison County.

Comment 40: The impact of the 400,000 cubic yards of fill in Coal Creek Valley on the recreational viability of the Coal Creek Wilderness Resort and its recreational experiences are not considered. (88)

Response: The Forest Service believes that discussions under "visual" and "outdoor recreation" on DEIS pp. 166-167 adequately discuss these impacts.

Comment 41: The DEIS (pp. 68-72) fails to mention the impact on the recreational activities for which the Coal Creek Wilderness Resort provides a base for up to 144 persons. (88)

Response: The discussion referenced occurs in Chapter 3, which only describes the affected environment, not impacts. The existence of private lands used for recreational purposes is recognized on DEIS p. 95.

TRANSPORTATION

Comment 42: The incremental increase of traffic on Colorado 135 will not be as great as described on DEIS p. 122. (79)

Response: This discussion has been corrected in the FEIS from "mine workers" to "project related traffic". The source of these projections is BMML (1981b, Table 10.5-M).

Comment 43: The Forest Service does not identify reduction in speed limits and increased enforcement as mitigation for increased traffic accidents. (79)

Response: These mitigation measures have been added. See FEIS Appendix B.

Comment 44: It is not valid to assume a directly proportionate increase in traffic accidents. (79)

Response: The methodology employed to predict traffic accidents on Colorado 135 is described in BMML (1981b, pp. 10-51). Review of this methodology will show that direct proportionality was not used as a prediction methodology.

Comment 45: Who will pay for the required improvements to Highway 135 and the Crested Butte bypass? When will these improvements be executed and under whose authority? (91)

Response: These matters have not been determined. The effects of not improving Highway 135, however, are discussed on DEIS p. 123. The consequences of not constructing the Crested Butte bypass are discussed on DEIS p. 41.

Comment 46: The DEIS fails to recognize that projected traffic volumes in the Almont to Jack's Cabin Cutoff section of Highway 135 presently exceed and will continue to exceed the service level C capacity even without the project. (79)

Response: This situation is discussed on DEIS p. 74.

Comment 47: The mitigations in the final EIS should stipulate the cost effect on the project and/or the communities of Crested Butte and Gunnison for a mass transit system. The responsibilities for this system should be presented in a manner which explains in detail who shall be responsible for what costs. (62)

Response: The matters of cost and responsibility for a mass transit system depend upon the outcome of negotiations beyond the Forest Service. The responsible parties have not completed these negotiations and so these items cannot be described at this time.

Comment 48: Contrary to the reason given for not analyzing the west access road to the Alkali Creek mill site (DEIS p. 41), there would be a distinct advantage in dividing the traffic just north of Gunnison and removing traffic from the constraining sections of Highway 135. (8)

Response: A principal reason for reducing traffic levels on Highway 135 is to stay within capacity level 'C' and avoid having to reconstruct the road. Regardless of whether or not mill traffic uses Highway 135 to Jacks Cabin cut-off, certain constraining sections of the road would still either need reconstruction or be reduced in capacity level (DEIS pp. 121-123). Therefore, the DEIS (p. 41) states this alternative offers no distinct advantage.

TRANSPORTATION (Continued)

Comment 49: The Forest Service calls for AMAX to initiate an agreement to repair or rebuild road surfaces affected by heavy truck traffic, however there is no factual support for a conclusion that AMAX usage of public roads will contribute substantially to routine road deterioration. (79)

Response: This is standard Forest Service practice where significant heavy truck traffic will use National Forest System surfaced roads. Formulas are published in Forest Service Handbooks (FSH 2409.22-20.2) for computing proportionate obligations and they will be applied at the time the details of the agreement are developed.

SOCIOECONOMICS

Comment 50: The statement that the Project will provide a stable economic and employment base (DEIS p. 217) is unduly optimistic. (1,23,27,32,40,49,51,58,70,91)

Response: This has been revised and is incorporated into the new discussion of Tradeoffs on FEIS pp. 16-17.

Comment 51: The DEIS does not incorporate AMAX's proposed growth management plan in its evaluation of impacts. (79)

Response: The DEIS and FEIS display the full range of outcomes from total mitigation to rebirth of the 'boomtown syndrome'. It was necessary to display this range because of the uncertainties associated with socioeconomic mitigation.

Comment 52: Who will pay for increased public services demanded as a result of growth? (91)

Response: Through cooperative discussion between representatives of local government, BMML, and AMAX, the assumption was made that growth would pay its own way.

Comment 53: The DEIS suggests that housing impacts will fall primarily on the City of Gunnison and surrounding area. The proximity of Crested Butte and Mt. Crested Butte to the project site compel the conclusion that housing impacts to these communities will be significant. (79,91)

Response: The spatial allocation of new residents was predicted using assumptions listed on DEIS pp. 210 and 213. These assumptions were developed cooperatively between BMML, representatives of local governments, and AMAX, as were the resultant estimates of population distribution. Housing requirements for the Towns of Crested Butte and Mt. Crested Butte are discussed in Chapter 8 of BMML (1981a,c,d). This material was incorporated by reference.

Comment 54: What will be the impact of the documented fiscal strain to local government? (91)

Response: This material is discussed on DEIS pp. 216-218, and in Chapter 11 of BMML (1981b,c,d), which were incorporated by reference.

Comment 55: Impacts on public services caused by cyclical reductions and closures of mining activities are ignored. (91)

Response: Closure is discussed on DEIS pp. 218-219 and 270. Cyclical effects are discussed under Tradeoffs on FEIS pp. 16-17.

SOCIOECONOMICS (Continued)

Comment 56: Impact on the 'quality of life' is ignored. (91)

Response: The topic was discussed on DEIS p. 124. See also Response 23-32.

Comment 57: What guarantee is there that socioeconomic mitigation will be attempted and be successful? (37)

Response: AMAX has frequently expressed a willingness to assist in the matter of socioeconomic mitigation, but final agreement on these matters have yet to be completed in most cases. The ultimate success of socioeconomic mitigation will depend not only on proper design and funding of programs, but also on the willingness and cooperation of the parties involved.

Comment 58: The statement "mobile home parks will likely proliferate..." (DEIS p. 214) assumes no County Land Use Resolution or control. (26)

Response: The statement is taken out of context. It is preceded by: "... if positive actions are not taken soon to create new, affordable housing...." The proliferation of mobile home parks was included as an example of a problem that could arise if effective preparation does not occur.

Comment 59: References to a tight housing market and chronic housing shortages are no longer accurate. The current recession, etc., have significantly altered the housing market in Gunnison County. (26)

Response: Agreed, there are more houses for sale now than in 1980, when BML collected its data. But the need for new housing associated with the Mt. Emmons Project is not diminished by the housing market's current softness.

Comment 60: How will AMAX insure that its massive land acquisition and lot development program will not monopolize the development market to the exclusion of smaller land developers? (26)

Response: This has not yet been resolved.

Comment 61: The DEIS discussion of social and economic impacts appears to be a worst-case analysis. There is no mention in the body of the DEIS of AMAX's extensive efforts to assist local governments, or of AMAX's specific plans to address growth impacts. (79)

Response: A discussion of AMAX's efforts is on DEIS pp. 262-270 and FEIS p. 16. The socioeconomic worst-case is identified on FEIS p. 18.

Comment 62: The proposal to build a full-service construction work force facility seems to segregate the rest of the community, perhaps creating severe alienation and social problems. (26)

Response: The intent of this facility is to partially mitigate the impacts of a short-term and seasonally variable construction workforce.

Comment 63: The DEIS should include a reference to AMAX's plan for a full service construction worker facility. (79)

Response: A reference has been added. See FEIS p. 10.

Comment 64: The DEIS should point out that a system for monitoring growth is being worked out. (79)

Response: This has been added. See FEIS p. 16.

SOCIOECONOMICS (Continued)

Comment 65: The DEIS should point out that it is unlikely that adverse impacts on the local housing market will occur. (79)

Response: This has been added. See FEIS pp. 16 and 18.

Comment 66: The text of the DEIS should more fully explain the details of AMAX's commitment to assist local governments in meeting the demands created by Project induced population growth. (79)

Response: This information is in Appendix A, which is part of the DEIS.

Comment 67: The DEIS gives the impression that the Gunnison County area is a static, rural, isolated area where little change currently occurs and which has little experience in dealing with newcomers and little sophistication in providing governmental services. (79)

Response: DEIS pp. 75-78 indicate that Gunnison County is neither static nor isolated.

Comment 68: The DEIS should provide more detail on the assumptions underlying the socioeconomic studies. (79)

Response: It was impractical to include full analytical details (nearly 1500 pages) from the socioeconomic studies (BMML 1980 a, b, 1981 a-d) in the DEIS, which is why the material was incorporated by reference. Representatives of the various local governments potentially affected by the Project, and AMAX, participated in the development of BMML's studies and received copies of the results. This information is widely available locally.

Comment 69: The DEIS should more clearly detail the benefits that the Project would bring at the local level. (79)

Response: This has been added. See FEIS pp. 16-18.

GEOLOGY

Comment 70: The DEIS did not mention mineral specimens as a valuable byproduct of the Project. (73)

Response: Mineral specimens are not a valuable byproduct of the Project. Few specimens are expected to occur due to the ore body's nature and the method of mining. They may be recovered incidental to operations according to chance of discovery and ease of extraction. They ordinarily fall into the hands of company employees.

Comment 71: Where will AMAX be getting its coal? (40,32)

Response: Local sources of coal are identified on DEIS p. 94. The source that AMAX will use, whether from local or Regional sources, has not yet been announced, as discussed on DEIS p. 249.

Comment 72: The exact location of sand and gravel pits used by the Project should be identified so that detailed impact studies can be performed. (32,40, 80,86)

Response: Exact locations are not known at this time; therefore, we cannot discuss impacts in detail. A general discussion is on DEIS pages 248-249. Additional details are expected prior to sand and gravel extraction.

SOILS

Comment 73: Short term impacts on soil resources prior to effective reclamation are ignored. (91)

Response: The short-term impact of productivity loss has been considered, as indicated by mitigation measures on DEIS pages 273 and 323. Additional details are in Walsh (1980b, Chapters 5,7-9). Other short-term implications discussed in the DEIS pertain to water quality and visual impacts; these discussions can be located through the topics Water and Visual Resources in the Index of the DEIS.

LAND USES

Comment 74: The access road to the Standard Mine mentioned on DEIS pp. 137 and 291 should be open to all persons with a legitimate need for access. (60)

Response: The reference to access rights on page 291 is a quotation from AMAX's environmental report and does not represent the Forest Service position. The mitigation measure proposed by the Forest Service in Table B-16 and the Forest Service permit for this particular road recognize the rights of other landowners.

Comment 75: The effects on cattle grazing are far understated: housing development and increased recreational use compete directly with ranchers' use of prime grazing land and contribute to harrassment of the cattle by people and domestic animals. (3)

Response: The DEIS discusses these effects and others on pp. 33 and 127-128.

Comment 76: The DEIS does not address impacts on the Coal Creek Resort. (4,88)

Response: There are innumerable tracts of private land in the project area which were not specifically mentioned in the DEIS. The Forest Service recognized that each landowner has intense interest in the impacts that might occur on their land and the DEIS addresses these impacts in a way to provide notice to all interested parties as well as inform the decisionmakers. Some examples are:

- DEIS p. 102 - loss of vegetation due to community development
- DEIS p. 104 - Molybdenosis
- DEIS p. 109 - Indirect water impacts
- DEIS p. 112 - Noise
- DEIS p. 114 - Visual Resources
- DEIS p. 128 - Urban, Suburban, Commercial, Industrial

Given the above types of discussions, the reader is also informed of approximately 40,000 pages of technical information pertinent to the DEIS, and of the availability of that information (DEIS pp. 6-7). See also the added discussion on FEIS, p. 11.

Comment 77: The DEIS does not discuss mitigation measures with respect to Coal Creek Resort. (88)

Response: The mitigation measures presented in Appendices A and B are presented in a manner which can mitigate the impacts irrespective of the landownership involved.

LAND USES (continued)

Comment 78: The economic impact on the Coal Creek Wilderness Resort has not been addressed. (88)

Response: To the extent this issue can be addressed, it is found on FEIS p. 11.

POWER SUPPLY

Comment 79: The DEIS should note that GCEA's preference, Alternative 2, has the highest suitability rating (most suitable). (90)

Response: This information exists in Table 2-4, DEIS p. 35. This interpretation was not emphasized because the differences between corridors, in both absolute numbers and percentages, were slight. Part of the explanation for slight differences is that major adverse effects were avoided early in the process of locating corridors.

Comment 80: Having dual voltage transmission systems (Alternatives 5 and 6) is not desirable from GCEA's point of view, and should be avoided if at all possible. (90)

Response: The Forest Service preferred alternative is Alternative 3, which does not include a dual voltage transmission system.

Comment 81: The DEIS fails to adequately discuss the impact on consumers' electricity rates in Western Colorado. (32,40,67)

Response: The Forest Service believes the DEIS discussion on pp. 107-108 is adequate.

Comment 82: With the large blocks of government land south, west and north of Gunnison, the transmission line segment west of Gunnison should be located on public land instead of private land. (66)

Response: The majority of all transmission line alternative configurations are located on public lands. Where private lands are within the corridors, it was a result of balancing several constraints. Reasonable precautions during site specific location should minimize impacts on private land use.

LAND EXCHANGE

Comment 83: The recreational impact of blocking public access from the Town of Crested Butte to the top of Mt. Emmons has not been considered. A strip of public land should be retained as a corridor separating CF&I land from the proposed AMAX land trade. (91)

Response: It would not be possible to reserve public access to the top of Mt. Emmons since AMAX proposes to apply for a mineral patent on an area approximately one half mile square which includes the top of Mt. Emmons, see DEIS p. 15. Additionally, if lands are exchanged liability in the subsidence area will be clearly with AMAX.

Comment 84: The proposed land exchange should consider the need of the Forest Service to acquire inholdings in wilderness areas. (3,91)

Response: Forest Service land classification plans recognize the need for acquiring wilderness inholdings. These plans were available to AMAX when they initiated their land acquisition, however, each exchange offer must be evaluated on its own merits rather than against the infinite possibilities of lands that could have been offered.

Comment 85: The Forest Service should not adopt the land exchange modifications for the following reasons:

1) Adequate Forest Service oversight and protection can be achieved through measures other than exclusions of necessary selected lands.

2) Omission of portions of the selected lands will reduce the tax base available to Gunnison County and seriously affect AMAX's ability to construct, maintain, and operate facilities located within lands being proposed for exclusion from the exchange.

3) A situation requiring permits for AMAX facilities on NFS lands would create an unnecessary administrative burden on the Forest Service.

4) Creating isolated parcels of public land would be in contravention of one of the principal purposes of the General Exchange Act.

5) The Forest Service would not acquire some of the offered lands, their related land consolidation benefits or environmental values. (79)

Response: All of these impacts and others will be considered before a decision is made on exchanging lands.

Comment 86: The DEIS does not address AMAX's proposal to acquire National Forest lands for its Red Mountain Tunnel facilities. (79)

Response: The Red Mountain Tunnel tract is discussed or described on DEIS pp. 14, 15 and 238. The impacts of the tunnel are incorporated into the ore haulage analyses in DEIS Chapter 4.

Comment 87: "I strongly recommend that the alternative boundary in Figure F-3 be redrawn to run northeast along the 9600 foot contour line above the Bog until it meets the private land boundary to the east. This would add the inlet to the Bog which is crucial to its survival and to its management." (77)

Response: The Forest Service will consider this suggestion as land exchange evaluations proceed.

LAND EXCHANGE (Continued)

Comment 88: The DEIS (pp. 237 and 240) states "The land exchange will not be completed until satisfactory agreements are reached between AMAX and other affected parties with leases and permitted uses." This position is inconsistent with the well-established principle of Federal pre-emptive power in the area of public lands management, and elevates the licensees and permittees to a status far greater than they currently enjoy under Federal ownership. (79)
Response: This has been clarified. See FEIS p. 18 and Appendix B.

Comment 89: The Forest Service is wrong in applying legal constraints to dispose of the No Action Alternative for land exchange (DEIS p. 43). (95)
Response: The discussion referenced points out that the public interest would not be served by an early rejection of exchange proposal. Both the DEIS (p. 36) and the FEIS (p. 18) point out that further analysis of the land exchange proposal is planned. The alternative to reject the proposal will be analysed at that time.

Comment 90: The Forest Service would be shirking its responsibility to protect a regional ecological anomaly if it were to give AMAX title to land that contains the Iron Bog. (32)
Response: This will be a consideration in the land exchange decision.

LAND CLASSIFICATION

Comment 91: The discussion on DEIS pp. 239-248 omits a significant number of the parcels offered by AMAX in exchange for public lands. (79)
Response: This discussion only deals with lands that the Forest Service proposes to modify the current classification plans to either disposal or acquisition. Since many of the offered lands are currently classified for acquisition they will not appear in this discussion. For details on all offered lands the DEIS (pp. 14 and 17) refers the reader to Glover, et. al. (1981).

MISCELLANEOUS

Comment 92: Backfilling the mine with tailing should be considered. (37)

Response: This has been added. See FEIS p. 4.

Comment 93: The DEIS does not determine that AMAX has found a 'valuable mineral deposit' and as such AMAX has no right to request construction of the mine as a matter of law. In fact, the announcement by AMAX to delay construction, because it is not presently economic, proves that the ore-body is not 'presently profitably marketable' so that no 'valuable mineral deposit' exists. (1,3,5,17,28,29,33,35,44,53,54,55,57,76,78,82,84,85,91,93,95)

Response: "A claimant to an unpatented mining claim is intitled to uses of the surface that are reasonably necessary to the accomplishment of bonafide prospecting exploration, mining, and processing of locatable minerals." (Forest Service Manual 2818)

If and when AMAX applies for patent to the Mt. Emmons deposit, a determination regarding its status as a valuable mineral deposit will be made. Such a determination will also be made if an abuse of the mining law is suspected, or if serious conflicts with the management of NFS lands arise.

Comment 94: The rationale for identifying the preferred alternative was not presented in the DEIS. (2,3,5,28,32,33,54,57,84,85,91,95)

Response: It was not required. Forest Service direction implementing NEPA is contained in the Forest Service Manual (FSM) Chapter 1950, Forest Service Handbook (FSH) 1909.15 and the Council on Environmental Quality's regulations in 40 CFR parts 15001508. FSM 1950 and FSH 1909.15 were rewritten effective November 19, 1981, and no longer require documentation of the rationale used in identifying the preferred alternative (Federal Register Vol. 46 No. 223, November 19, 1981 pages 56998-57017).

Comment 95: The alternatives presented are not a "full spectrum" of alternatives. Certain key mitigation features (such as underground power lines) are included in alternatives that are otherwise unacceptable for critical reasons. (1,44,54)

Response: The seven alternatives in the broad sense, and their specific features in the detailed sense, present the full spectrum of alternatives. As pointed out on DEIS p. 9, desirable features of one alternative may be grouped with those of another.

Comment 96: There is no exploration or rationale for the alternative features which are grouped together. (54,91)

Response: This has been clarified. See FEIS p. 3.

Comment 97: There is no methodology for comparing alternatives to each other. (91)

Response: The bulk of the comparisons can be found on DEIS pages 28-37. The information base for these comparisons can be found in Chapter 4. In addition, the basis for each comparison made is briefly noted in the comparison discussion.

MISCELLANEOUS (Continued)

Comment 98: Statements regarding the impacts of Alternatives, such as "minor", "avoidable", and "not significant" are generalizations which are not explained or supported by analysis. (4,23,27,44,49,51,57,58,70,81,85,91)

Response: From the introductory passages of Chapter 4 (DEIS, pp. 99-100):
"The analyses discussed in this chapter are as specific as existing data permit. Some analyses are based on intensive studies that make it possible to predict impacts in considerable detail. Other analyses are based on experience and professional judgement, and for these it is more a matter of predicting the pattern or trend of impacts rather than predicting them in quantitative terms. This is adequate for making a reasoned comparison of alternatives."

This passage was included because the preparers of the DEIS were fully aware that not all impacts could be quantified, and that professional judgements would have to be made in some instances. This generally occurred where complete design details were not available (such as construction plans), or where subjective evaluations could not be avoided (such as the meaning of an elk herd).

Comment 99: There is no discussion of how data supplied by the proponent (AMAX) has been verified by the Forest Service. Some studies relied upon by the Forest Service (Ex. Black and Veatch Report) have been discredited by the Forest Service. (17,44,54,82,85,91)

Response: See Response 26-10. The reference to Black and Veatch (1980) was only to indicate that alternative sources of water have been identified. Questions regarding the feasibility of these alternatives were not addressed.

Comment 100: The public need for project development has not been identified, even though public costs have been displayed. (15,17,32,33,40,44,53,54,56,71,82,85,91)

Response: The evaluation of need for a product such as molybdenite is largely left to the private sector. This evaluation is based partly on the projected supply-demand picture, and partly on the price-competitiveness of the product in the market place. Thus, even though the current over supply of molybdenum may continue for several years or more, AMAX might still seek to develop the Mt. Emmons Project if it feels it can compete successfully with other suppliers of molybdenum.

Comment 101: The High County Citizens' Alliance, through appeal, forced the Forest Service to initiate the Mt. Emmons EIS process. (1,91)

Response: Not true. The Forest Service began the EIS process once it knew a Plan of Operations for the mine was forthcoming. The appeal referred to dealt with the 1978 Summer Operating Plan.

Comment 102: The FEIS should address the comparative costs to the various parties of litigating the FEIS as a compliance document. (86)

Response: This is not a necessary step in environmental analysis. The Forest Service did not address the topic.

MISCELLANEOUS (Continued)

Comment 103: The Forest Service may deny easements for ancillary facilities since they are not in the public interest. (1,91)

Response: Forest Service Manual (2813.14) states:

"The right of reasonable access for purposes of prospecting, locating, and mining is provided by statute. Such access must be in accordance with the rules and regulations of the Forest Service. However, the rules and regulations may not be applied so as to prevent lawful mineral activities or to cause undue hardship on bona fide prospectors and miners." A determination on the public interest will be made in the Record of Decision covering easements; it will be based on consideration of the information in the FEIS and of additional items as appropriate.

Comment 104: What happens if AMAX doesn't start operations for 20 years? Is the Plan of Operations still valid? (3,32,40)

Response: The Project's schedule is a part of the Plan of Operations, and any change in the Plan is subject to Forest Service approval. Additional environmental analysis may be necessary, depending on conditions at the time of request for a change.

Comment 105: Is the reclamation plan offered by AMAX bound by law? If not, how does the Forest Service plan to insure its implementation? Will a bond be posted in advance to cover its cost? (3)

Response: The Forest Service has the authority to require bonding in an amount sufficient to cover the costs of reclaiming NFS lands disturbed by the Project. This will be addressed in the Forest Service Record of Decision.

Comment 106: The No Action alternative was not analyzed in sufficient detail. (23,27,46,49,51,58,70,79,80,91)

Response: Its effects are displayed in Chapters 3 and 4; it is compared with other alternatives in Chapter 2.

Comment 107: CEQ's regulations implementing NEPA require that the environmentally preferable alternative be identified as agency preferred, unless non-environmental factors or agency "statutory mission" compel otherwise. (91)

Response: The requirement is not in CEQ's NEPA regulations.

Comment 108: The features of Alternative 6 (Small Mine) do not conform to the publicly understood and advocated small mine concept because of economic considerations. Profitability of an alternative vis-a-vis its features should not be a consideration when a "full spectrum" needs to be presented to decisionmakers. (91)

Response: The Small Mine design that arose as a public issue was considered but not analyzed in detail because it is not economically feasible to implement (DEIS p. 42). CEQ's direction is to analyze reasonable alternatives (40 CFR 1502.14); one that is economically unfeasible is not reasonable.

MISCELLANEOUS (Continued)

Comment 109: The level of environmental data acquired for each of the alternatives is not equal. Considerably more data was generated for Alternatives 2 and 3 than for the others. When this is the case, how can alternative evaluation be fair and equal? (91)

Response: The EIS displays equal levels of detail for Alternatives 1-7, but it is true that in some cases greater detail is available for Alternative 2 and 3. Most of this information pertains to engineering and permitting concerns; it was prepared at AMAX's discretion. The information available via the EIS is adequate for environmental analysis and comparison of alternatives. If the final design of the Project differs radically from AMAX's current proposal, detailed information similar to that collected for Alternative 2 will also be collected.

Comment 110: It is apparent from references in the DEIS that the individuals responsible for the preparation of the DEIS believe that the No Action alternative is not viable, since they assume it cannot be implemented. Reference to constraints on decision authority, and therefore constraints on the "no action" alternative, are liberally sprinkled throughout the document (in particular pages 9, 11, 36, 42, 43, 160, and 237). Constraints on decision authority are relevant to the Record of Decision, but they improperly bias the environmental analysis. (91)

Response: Alternatives 1-7 were developed and analyzed without regard for Forest Service jurisdictional limitations. The No Action alternative was discussed in many places throughout the DEIS. The cited discussions involving constraints on Forest Service authority, whether real or perceived, were included for the purpose of assessing the implications of actions that the Forest Service or AMAX might take. They did not constrain analysis of the No Action alternative.

Comment 111: Contrary to assertions in the DEIS, lands needed for ancillary facilities are not otherwise available to AMAX under the Millsite Patent Act. (91)

Response: From Forest Service Manual (2811.33):

"When nonmineral land is needed and used, or occupied by a proprietor of a placer claim for mining, milling, processing, beneficiation, or other operations in connection with such claim, the nonmineral land may be included in an application for patent for the placer claim. The number of millsites that may be legally located is based specifically on the need for mining or milling purposes, irrespective of the types or numbers of mining claims involved." This principle applies similarly to lode claims and has long been recognized in law. The law pertaining to millsites for placer claims was passed to affirm that the mill site act did not apply to lode mining only.

Comment 112: The occurrences of unanticipated impacts should be considered a possibility. (91)

Response: A provision for unanticipated impacts on NFS lands is included as the first mitigation of Table B-18 (DEIS p. 325).

MISCELLANEOUS (Continued)

Comment 113: The DEIS looks at idealized alternatives whose actual environmental effects cannot be determined with sufficient accuracy to permit a useful assessment of their comparative merits. The use of generalized and undemonstrated mitigation measures prevents the accurate quantification and full disclosure of the consequences of approving various alternatives as they would actually be implemented. (91,93,95)

Response: It is impractical for all design and construction details to be known at this time in a project of this scale and complexity. Some generalization is thus unavoidable, as is the need for making certain assumptions regarding mitigation. Because of this, the DEIS contains a number of worst-case analyses that might not be needed under other circumstances. It also recognizes that more site-specific design details will become available prior to construction, and thus includes a mitigation measure (the first one in Table B-18, DEIS p. 325) that calls for Forest Service approval of construction or surface-disturbing activities. In addition, even though a number of impact discussions may appear to be generic, they accurately describe the nature of impact, the approximate magnitude expected, and an assessment of significance.

Comment 114: In order to support a rational selection of mitigation measures, the DEIS must: (1) identify specific, practical steps within each alternative that can reduce ecological consequences and which can be evaluated, and (2) determine the effect on the environment of including such steps. Without this analysis, any Forest Service choice among the mitigation measures listed in Appendices A and B is entirely arbitrary. (95)

Response: AMAX submitted a mitigation plan, which is included in the DEIS as Appendix A. Based on its experience and expertise, the Forest Service felt it necessary to modify AMAX's plan. This resulted in the mitigations listed in Appendix B. Impacts were then analyzed assuming that mitigations were in place where the Forest Service felt it could require them, and conducted worst-case analysis where it could not.

Comment 115: If the FEIS cannot substantially reduce the fundamental uncertainties inherent in the DEIS's discussions, the FEIS must include a worst-case scenario for each alternative and an assessment of the probability of occurrence. (95)

Response: Uncertainties of this nature have been recognized. The DEIS and FEIS contain 26 and 6 worst-case analyses, respectively, to account for uncertainty. These analyses apply to specific aspects of project design rather than to complete alternatives; this approach was taken to provide a clearer picture of Project impacts than would a complex multi-component worst-case analysis of each alternative.

Comment 116: The description of the No Action alternative should be changed to make clear that it involves Forest Service denial of AMAX's Plan of Operations and land exchange proposal, and of Gunnison County Electric Association's easement applications. The DEIS's description of the No Action alternative is misleading in that it suggests Forest Service approval followed by AMAX's decision not to develop the Project. (95)

Response: The No Action alternative could conceivably become reality under a variety of circumstances. The DEIS concerned itself with the impacts of the alternative, not with the various ways in which it could arise.

MISCELLANEOUS (Continued)

Comment 117: The DEIS is neither an adequate nor plausible basis upon which to choose between mitigation measures whose individual costs and effectiveness in reducing environmental damage have never been considered. (93)

Response: Several major mitigations are included as basic aspects of the seven alternatives analyzed. For example, Alternative 4 mitigates impacts on the Coal Creek municipal watershed by removing nearly all activities from the watershed. The DEIS recognizes this advantage, but also points out some of the disadvantages that will also occur under Alternative 4, especially those associated with bringing the mine site and ore haulage route into closer proximity with Crested Butte and the Colorado 135 travelway. Mitigations of a lesser scale, such as sediment settling basins, were not analyzed as thoroughly in the DEIS because their design specifics will not be known until later. Nevertheless, some assessment was made of their effectiveness and of the consequences of their failure, should failure occur.

Comment 118: The Forest Service has truncated the DEIS's consideration of alternatives by pre-judging legal constraints so as to eliminate parts of the No Action alternative and to discard other reasonable alternatives. For example, the No Action alternative for land exchange is rejected on DEIS p. 43 for legal reasons since the Forest Service contends that "the Project is authorized under the 1872 Mining Laws". (95)

Response: Legal constraints were among the items considered by the Forest Service while determining which alternatives would be eliminated from further detailed study. This item was used only when it seemed clear, in the Forest Service's judgment, that legal feasibility was highly unlikely. The land exchange "rejection" is being misinterpreted. No Action on land exchange is, naturally, a part of Alternative 1 and is discussed on DEIS pp. xviii, 36, 237, 250, and 366-367. Analysis of a land exchange proposal of this magnitude takes a few years to complete, and what DEIS p. 43 "rejected" was the notion of terminating the analysis prior to making a determination regarding the public interest. This determination is to be made by the Chief of the Forest Service.

Comment 119: The bar charts and accompanying text on DEIS pp. 29-37 constitute guesswork masquerading as analysis. Based on this information, Alternative 1 has the fewest impacts and should be the option chosen. (95)

Response: The bar charts were based on professional judgment of relative degrees of impact and risk. The selected alternative, and the reasons for the selection, will be described in the Forest Service Record of Decision.

Comment 120: The FEIS should consider molybdenum separation (milling) technology using the bacterium Sulpholobus brierleyi. (87)

Response: As this technology is still in the development stage and its influence on reducing environmental impacts is unknown, the Forest Service did not consider it.

Comment 121: The DEIS should be written to require the company be responsible morally and monetarily for the degradation of the public environment. (32,80)

Response: An EIS does not require anything from a proponent. The purpose of an EIS is to disclose impacts and consequences of the proposed action and alternatives to that action. Mitigation requirements will be specified in the Forest Service Record of Decision and other permitting documents.

MISCELLANEOUS (Continued)

Comment 122: The DEIS does not list under the "No Action" alternative, the benefits of not building the mine. (80)

Response: There are many ways to display the effects related to the alternatives. The CEQ does not require a specific format for display. The effects associated with the No Action alternative are described in the DEIS pp. 28-37 and 99-256.

Comment 123: The impacts which are displayed are not accompanied by a plan for putting them into action. (1,81)

Response: The Plan of Operations, as approved, will describe the actions planned and the mitigation measures that will be implemented on NFS lands.

Comment 124: The Forest Service should revise several of the analyses of subsidence effects from the worst case condition of a 45° caving angle to the most likely event of a 60° caving angle. (79)

Response: The Forest Service believes the DEIS adequately explains the analytical assumptions and range of possible conditions. FEIS p. 19 contains a revised discussion under 'Relationship Between Short-term Uses of Mans Environment and the Maintenance and Enhancement of Long-term Productivity' to include the most likely subsidence event.

Comment 125: The DEIS over-utilizes the worst-case analyses since sufficient data and information is available to assess impacts. (79)

Response: The Forest Service believes the worst-case analyses were used appropriately, for several reasons. The Forest Service can neither require nor guarantee that appropriate mitigation measures will be implemented accept on NFS land. In other cases, given the available information, several reasonable experts might disagree on the expected effects.

Comment 126: Some of the mitigation measures proposed attempt to correct pre-existing problems and problems not substantially enlarged by AMAX. In these cases AMAX should be responsible to fund mitigation, only to the extent of its contribution to the impact. (79)

Response: The Forest Service agrees. The introduction to Appendix B (DEIS p. 301) recognizes limitations in applying mitigations. Further, the DEIS only identifies possible mitigation measures, not who will fund them.

Comment 127: We recommend that the introduction to Appendix B be amended to include a statement expressly recognizing the agency's obligation to take into account practicality and feasibility in legal, economic, and engineering terms. (79)

Response: The Forest Service believes this concern is expressly recognized in items 1 and 3, DEIS p. 301.

Comment 128: There is no justification for rejecting the alternative of a slower construction schedule based on "legal feasibility" (DEIS p. 43). (95)

Response: The comment on legal feasibility was not questioning the authority of the Forest Service alone, but of any other public authority to regulate construction schedules.

MISCELLANEOUS (Continued)

Comment 129: Each of the alternatives is considered only on the assumption that all mitigation measures listed in Appendices A or B are imposed and effective, despite the fact that no specific mitigation measures are designed or analyzed. The results of any comparison among the results of such a discussion is hypothesis, not analysis. (93,95)

Response: Only the mitigation measures that the Forest Service may require on NFS lands are assumed to be in place and effective (DEIS p. 301). Of course any comparison that must be based on predictions of future conditions is based on hypothesis and assumptions. The Forest Service recognizes this qualification in attempting to display the most probable effects associated with each alternative.

Comment 130: The DEIS vagueness and omissions deprive the public of the effective right to comment. (84,88)

Response: The public comments received on the DEIS have been considered and the resulting changes are minor. Parties who feel their concerns have not been considered may appeal resulting decisions under the Secretary of Agriculture Regulation 36 CFR 211.19.

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APPENDIX A. AMAX'S MITIGATION, AVOIDANCE,
AND ENHANCEMENT MEASURES

(not included; same as in DEIS)

APPENDIX B. MITIGATION MEASURES

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APPENDIX B: MITIGATION MEASURES

(DEIS p. 301-326: because of numerous changes, this appendix is included in its entirety.)

This appendix contains reasonable mitigation measures that apply to Alternatives 3-7. These mitigation measures have been consolidated from the following sources: Forest Service (1982a), BML (1981 a-d), AMAX (1981a), and various comments made on the DEIS. The mitigation measures that the Forest Service may require to mitigate impacts that occur on NFS lands are listed in Table B-1 and are assumed to be in place for the impact analyses described in Chapter 4. Table B-2 contains other mitigation measures which, along with those in Table B-1, may be considered by other governmental agencies: the likelihood of occurrence of these mitigations is discussed as appropriate in Chapter 4.

It must be clearly understood that NEPA does not require mitigation measures be implemented by the proponent or anyone else. Likewise, it must be understood that the task of the Forest Service required by NEPA is to disclose impacts and consequences of the proposed action and alternatives to that action. In doing so, the following must be recognized:

(1) Any mitigation required by the Forest Service

will relate only to impacts on NFS lands and must be based on legal authorities of the Forest Service.

(2) The disclosure of impacts and the discussion of mitigation methods is for the purpose of providing those agencies of government (Federal, State, and local) with decision authority regarding the Project, information they may use in approving or denying within their authority. Such information is also provided so that the proponent and the public at large are aware of at least part of the information being used by the various agencies in making their decisions.

(3) When determining what mitigation measures will be required on NFS lands, Forest Service officials must consider: authorities under existing law, regulation, and policy; economic feasibility; land management objectives; and the impacts and consequences disclosed in the EIS. Forest Service required mitigation must be in accord with the Forest Service authorities which apply to the activity under consideration. The Record of Decision will identify, by inclusion or specific reference, the mitigation measures and necessary monitoring programs. The required Forest Service mitigation measures will become terms and conditions of any permit or authorization.

(4) Forest Service officials will sit at the negotiating table, if requested, to assist other levels of government, as well as the proponent, in interpreting the

EIS information and to provide technical assistance relative to the Forest Service area of professional expertise. The role of the Forest Service should not be considered as "mitigation facilitator."

TABLE B-1: FOREST SERVICE MITIGATION MEASURES

TABLE B-1: FOREST SERVICE MITIGATION MEASURES

This table contains mitigation measures that the Forest Service may require to mitigate impacts that occur on NFS lands.

VEGETATION MITIGATION MEASURES

Impact: Disturbed and tailing areas in need of reclamation

Mitigation: AMAX has prepared a detailed reclamation plan which is included in Appendix A (DEIS) for Alternative 2. These plans are too detailed to require one for each alternative but it is assumed that similar principles would be applied to develop a reclamation plan for the selected alternative.

Impact: Potential drying of Mt. Emmons Iron Bog

Mitigation: Conduct a transplant viability study to determine whether seeding or transplanting sundews into bogs of similar characteristics is viable.

Mitigation: Conduct intensive studies of the sundew plants. Include genetics, reproduction and environmental tolerances.

Impact: Vegetation destruction and alteration

Mitigation: Limit surface disturbances to those necessary for Project activities.

Mitigation: Do not build roads solely for surveying purposes.

Mitigation: Revegetate disturbances as quickly as practical with the vegetation forms disturbed. (All mitigations requiring seeding or planting of grass, trees, or shrubs will be done as soon as seasonally practical following disturbance. Measures such as fertilizing, mulching, and watering will be done as necessary to insure establishment within two growing seasons following planting.)

Mitigation: Clear vegetation using natural "lines" and clear only for direct Project needs or for visual enhancement.

Mitigation: Do not remove vegetation until a final Project location has been established.

Mitigation: Restrict rights-of-way clearing for powerlines to that actually needed for electrical clearance. Topping will be used wherever practical.

Mitigation: Utilize high conductor clearances in forested areas to allow the retention of all but the tallest trees in rights-of-way near roads and highways.

Impact: Loss or disturbance of riparian or wetland vegetation and farmland

Mitigation: Leave freshwater reservoirs for public use following project closure.

Mitigation: Where possible, reclaim gravel pits as lakes and wetlands.

Mitigation: Place powerline structures and adjust spans to avoid impacts on riparian vegetation.

Impact: Decreased productivity due to dust

Mitigation: Use dust controls (water, petrocohesives) on exposed roads, tailing beach area, and other Project areas where fugitive dust is a problem.

Mitigation: Pave major access roads, in-plant roads, and parking lots.

Mitigation: To the extent necessary, maintain a water pool or sprinkling system on tailing pond.

Impact: Accumulation of cleared materials

Mitigation: Dispose of cleared materials by burning, burial, stockpiling for later reclamation, or distribution as firewood as approved at site specific locations by the responsible official.

Impact: Removal of commercial timber

Mitigation: Removal of commercial timber on National Forest System lands will be subject to standard R-2 timber sale clauses and stipulations for timber settlement procedures. Timber to be cut shall be so designated by the Forest Service.

Impact: Impacts related to increased human population, housing-service developments, birdwatchers, photographers may have impact on sage grouse leks. Ohio Creek leks are on private land which could be developed for housing.

Mitigation: Protect sage grouse lek areas based on CDOW management plans.

Mitigation: Cooperate with CDOW to create new sage grouse breeding grounds on public lands on south and west sides of Flat Top.

Impact: Increased human presence in the Iron Bog for research purposes, curiosity, or collection of unusual plant species

Mitigation: Protect the Iron Bog from disturbance by equipment.

Mitigation: Control dust through watering, petrocohesions or other techniques.

Mitigation: Include Kebler Pass Road in dust control program, or pave all major Project access roads.

Mitigation: Implement an Iron Bog protection and management plan.

Impact: Impacts related to disposal of NFS lands having wetlands

Mitigation: Place wetlands into public ownership via forest exchange.

Impact: Damage to sensitive vegetation by transmission line construction

Mitigation: Remove and replace "pads" of vegetation around tower foundations.

Mitigation: Use articulated equipment with ground pressure less than 10 psi.

Mitigation: Use helicopters for construction or location of towers.

Mitigation: Establish pull sites at areas accessible by existing roads.

Impact: Sediment deposition damaging the sundew plants. (Alternatives 2,3, and 5-7)

Mitigation: Install sediment diversions between upslope fills and the Iron Bog.

WILDLIFE MITIGATION MEASURES

Impact: Habitat destruction and alteration

Mitigation: Limit area disturbed for construction, to that necessary for Project activities.

Mitigation: Leave areas of natural habitat in and around facilities wherever possible.

Mitigation: Design facilities and construction activities to avoid riparian, wetland areas, and aspen stands wherever possible.

Mitigation: Develop existing springs and ponds on lands not being used for construction and plant with willows and cottonwoods.

Mitigation: Create or reconstruct aspen woodlands and riparian or wetlands areas.

Mitigation: Essential wildlife habitat such as ptarmigan winter areas and sage grouse strutting areas, will be avoided wherever possible.

Mitigation: To the extent feasible, roads and other transportation facilities will be located away from the edge between two vegetative types, so that the "edge effect" can be maintained for wildlife.

Mitigation: Short snags and dead or dying trees used by cavity dwelling wildlife will be left within rights-of-way wherever possible.

Impact: Increased population will place increased pressure on existing habitats in project area and the County to a lesser degree.

Mitigation: Protect or acquire habitats of special importance or high sensitivity (e.g., critical winter range, sage grouse breeding grounds, colonial bird nesting sites, riparian habitat, etc.). Consider important wildlife habitats in land purchases for trade (aspen woodlands, riparian areas, wetlands, winter range and alpine areas).

Impact: Potential contamination of adjacent habitats by fugitive dust

Mitigation: During ore handling, stockpiling, and transportation in the open, use appropriate fugitive dust control measures.

Impact: Mobile species will be displaced into adjacent habitats which may cause increased stress to habitats and populations resident to those habitats. Species displacement also may change species composition, diversity, and abundance in adjacent habitats.

Mitigation: Improve habitats (food, water, cover) in areas adjacent to construction areas. Habitat improvement techniques including planting of high value food species and fertilization may be used.

Impact: Increased noise (particularly blasting), fugitive dust, and human presence may disrupt critical life-cycles such as breeding, nesting, brooding, roosting, young-rearing, migrations, predator-prey relationships, etc.

Mitigation: Develop a blasting plan to prevent adverse effects during crucial periods such as night, dawn, and dusk, and during May and June for calving areas and December through March on big game winter range areas.

Mitigation: Insofar as practical, conduct blasting activities at same time (daily or weekly) to allow animals the chance to adapt to a more regular schedule. Construction activities will not disturb crucial wildlife habitat areas during critical periods. These determinations will be made on a site-by-site basis. The dates are: deer and elk winter range, December 1 to March 31; elk calving areas, May 15 to June 15; sage grouse strutting and nesting areas, April 15 to June 30; raptor nesting and rearing areas, March 1 to June 30;

ptarmigan wintering areas, October 1 to May 31; Brown trout spawning and hatching areas, November 1 to February 15; Brook trout spawning and hatching areas, September to December 31.

Mitigation: Restrict vehicular off-road travel in habitats adjacent to construction activities during the main bird breeding/nesting period of mid-May through mid-June.

Mitigation: Conduct educational programs to sensitize employees to the need for minimizing disturbance.

Mitigation: Cooperate with Forest Service and CDOW in developing and implementing a comprehensive wildlife management program.

Impact: Impacts on big game habitat, populations, and life cycles from construction, operation, and increased direct and indirect human activity

Mitigation: In cooperation with Forest Service and CDOW, increase productivity of existing winter range areas on NFS lands through fertilization and/or range improvement programs.

Mitigation: Except for areas of high public hazards, railroad and access roads will be unfenced, or fenced only with low stock fences.

Mitigation: Restrict blasting to a regular daylight schedule.

Mitigation: Maintain aspen "fingers" used as movement routes.

Mitigation: Natural vegetation in lower Alkali Creek drainage area will be maintained where practical.

Mitigation: When and where possible, construction activities in the open will be reduced during periods of darkness in May, November, and early December.

Mitigation: Design access roads for good visibility and post low speed limits.

Impact: Increased presence of humans will increase pressure on huntable species, increase the risk of vehicle-wildlife collisions, increase the chance human-wildlife conflicts, increase the incidence of collecting (reptiles, amphibians, bird nests, etc.) by humans. Increase in domestic pets (cats and dogs) will increase the likelihood of wildlife being killed or harassed.

Mitigation: Cooperate with management agencies in implementing public awareness programs to: 1) the sensitivity of wildlife; 2) warn the public of disease potential, particularly concerning rodents; 3) warn the public against feeding wildlife, leaving refuse in the open, and approaching wildlife for observation.

Impact: Increased human populations may increase pressure on remote areas and sensitive areas such as alpine systems, research sites, etc. Activities such as birdwatching and wildlife photography will increase, causing possible alterations in life cycles of such species as cranes, eagles, sage grouse (on the leks), etc.

Mitigation: Cooperate in research activities to locate unusual species populations and habitats on potential development areas. Cooperate with agencies and research institutions in protecting known threatened or endangered species locations. Cooperate in possible reintroduction programs or recovery.

Mitigation: Design public awareness programs relative to laws, regulations, ecological sensitivity of certain areas, and area research programs and sites.

Impact: Impacts related to increased human population, housing-service developments, birdwatchers, photographers may have impact on sage grouse leks. Ohio Creek leks are on private land which could be developed for housing.
Mitigation: Protect sage grouse lek areas based on ODOW management plans.
Mitigation: Cooperate with ODOW to create new leks on public lands on south and west sides of Flat Top.

Impact: Pollution of receiving streams from accidental spills of oil, diesel fuel, or other supplies
Mitigation: Include in spill plans arrangements for a warning system to alert downstream users (including Roaring Judy Fish Hatchery).

AQUATIC ECOLOGY MITIGATION MEASURES

Impact: Habitat alteration including stream bank disruption and increased sedimentation during construction, causing temporary reduction in spawning success and reduction in habitat of fish food, especially benthic invertebrates

Mitigation: Design and construct roads and crossings to minimize encroachment into stream channel and so as to not block fish movement.

Mitigation: Utilize erosion controls during construction; time construction to avoid, where possible, activities during spawning seasons.

Mitigation: Restore and enhance lower Coal Creek fishery habitat.

Impact: Pollution of receiving streams from accidental spills of oil, diesel fuel, or other supplies

Mitigation: Establish emergency contingency program for accidental spills; include in spill plans arrangement for a warning system to alert sensitive downstream users. Dike all oil, diesel fuel, and similar storage areas.

Impact: Interference with the maintenance of favorable conditions of flow

Mitigation: Regulate reservoir releases in such a way that favorable conditions of flow are maintained year-round.

Impact: Culverts blocking fish from migrating upstream

Mitigation: Where upstream fisheries exist, culverts will be installed using Principles and Guidelines in Evans, 1972. These include allowing for fish passage 90% of the time in a 6 month period.

WATER MITIGATION MEASURES

Impact: Decreased surface water quality

Mitigation: Locate milling facilities so that any spills are tributary to the tailing pond.

Mitigation: Revegetate disturbed areas as soon as seasonally possible. Grade unpaved roads and restrict vehicle traffic, particularly during spring snow-melt. Intercept and divert erosion sediment into settling basins. Work in stream channels only during periods of low flow except in emergencies. Construct culverts to divert runoff of natural drainages. Route surface runoff away from construction areas. Use water bars, rip rap, gabions and other erosion controls.

Mitigation: Maintain roads, ditches, and culverts.

Mitigation: Control fugitive dust emissions.

Mitigation: Dike all oil, diesel fuel, and similar storage areas; establish emergency contingency program for accidental spills including a warning system for the Town of Crested Butte and Roaring Judy Fish Hatchery; use oil skimmers and separators on settling ponds.

Mitigation: Use mine drainage water in operations, or treat at heavy metals water treatment plant before discharge.

Mitigation: Provide tertiary treatment of domestic wastes before discharge. Dispose of waste sludges at designated sites.

Mitigation: Conduct operations such that debris does not enter streamcourses.

Mitigation: Design artificial drainages (including ditches) to reconnect with existing drainages only after treatment designed to remove the bulk of sediment entrained in the artificial drainage.

Mitigation: Do not collect several small-order streams and concentrate them in a channel that cannot handle the extra flow.

Mitigation: Install culverts, bridges, or low-water fords where it is necessary to cross streamcourses. Protect the integrity of stream bottoms where a fishery exists.

Mitigation: Construct the tailing area flood bypass system and mill water reservoir prior to ground disturbance for the tailing dam and disposal area.

Mitigation: Artificial drainages associated with permanent facilities will be designed to accommodate a 100 year runoff event.

Mitigation: Place energy dissipators at culvert outlets to minimize scouring.

Impact: Surface-water flow changes

Mitigation: Regulate reservoir releases in such a way that favorable conditions of flow are maintained.

Mitigation: Intercept surface flows above, divert around, and discharge downstream of tailing disposal area.

Mitigation: Construct tailing dam with impervious core to prevent seepage into surficial geologic units.

AIR QUALITY MITIGATION MEASURES

Impact: Fugitive dust emissions in the mill-tailing area
Mitigation: Pave major access roads, service roads, and parking lots.
Mitigation: Place water and/or adhesive binder on unpaved roads.
Mitigation: Maintain dust control measures on tailing disposal site.
Mitigation: Revegetate tailing dam face.

Impact: Fugitive dust emissions at the mine site
Mitigation: Pave major access roads, in-plant roads and parking lots.
Mitigation: Revegetate disturbed surfaces.
Mitigation: Place water and/or adhesive binder on unpaved roads.

NOISE MITIGATION MEASURES

Impact: General construction noise
Mitigation: Where possible confine surface construction to daytime hours.
Mitigation: Ensure that all motorized equipment has operational exhaust mufflers.

Impact: Blasting noise
Mitigation: Limit surface blasting to daytime hours wherever possible.

Impact: Operational mine site noise
Mitigation: Ensure operational mufflers on all above-ground motorized equipment.
Mitigation: Ventilation system - reduce intake and exhaust fan noise by use of specially designed housings.

Impact: Operational ore haulage system noise
Mitigation: Use locomotive horns or whistles only where required.

CULTURAL RESOURCE MITIGATION MEASURES

Impact: National Register Eligible Sites - aboriginal - which will be directly disturbed
Mitigation: Total surface collection and partial or complete excavation of sites on NFS lands, and analysis of the contents.

Impact: National Register Eligible Sites - Euro-American - which will be directly disturbed
Mitigation: Buildings on NFS lands with standing architecture will be mapped, sketched, photographed, and a history search will be conducted.
Mitigation: Partially excavate ancillary trash deposits on NFS lands.

Impact: Sites that will not be disturbed
Mitigation: Protect National Register Eligible sites through security patrols, fencing, etc., on NFS lands.

Impact: Unauthorized collection of artifacts and site vandalism

Mitigation:

Conduct awareness program relative to significance of heritage resources and laws and regulations governing site protection.

Impact: Damage to sites not yet identified

Mitigation: Conduct an archaeological inventory at AMAX's cost prior to clearing on NFS lands in order to locate, evaluate, and mitigate impacts to archaeological resources. Excavation will be performed according to the Uniform Rules and Regulations of the Secretaries of Agriculture, Interior, and Defense that pertain to the excavation of archaeological sites. The responsible Federal Agencies shall continue the procedures for determination of eligibility and effects as specified in 36 CFR part 800. For eligible properties determined to be adversely affected, a Memorandum of Agreement will be prepared in accordance with 36 CFR 800.6c.

Mitigation: If during excavation work, items of substantial archeological or paleontological value are discovered, or a known deposit of such items is disturbed, cease excavation in the area so affected. On NFS land notify the Forest Service and do not resume excavation until written approval is given.

VISUAL RESOURCE MITIGATION MEASURES

Impact: Mine and mill areas change visual quality

Mitigation: Follow existing vegetative patterns when clearing area (i.e., do not create linear or rectangular openings); retain natural topographic features where practical.

Mitigation: Wherever possible, retain as many stands of existing vegetation as practical. Locate facilities to fit existing vegetation openings instead of creating new ones. Fit parking lots, storage areas, and buildings into vegetation where practical.

Mitigation: Place major parking lots and equipment storage areas behind screening berms, vegetation, or buildings. Retain patches of shrubs and trees throughout, if possible.

Mitigation: Revegetate all areas as soon as seasonally possible with species native or adapted to the particular plant community disturbed. Do not plant species which may conflict structurally with the existing plant community (e.g., trees in sagebrush areas, etc.).

Mitigation: Develop berms where practical as extensions of natural topography. Revegetate berms with compatible species.

Mitigation: Design (color and shape) facilities to be compatible and blend with existing landscape, where practical.

Mitigation: Control emissions and fugitive dust.

Mitigation: Limit nighttime lighting to what is necessary; shield from view.

Mitigation: Reduce clearing of aspen to minimum. Preserve the aspen fingers on the south side of Red Mountain.

Impact: Long-term changes in visual quality

Mitigation: Dismantle unnecessary structures following operations.

Mitigation: Revegetate disturbed areas as soon as seasonally possible.

Impact: Roads and ore haulage system change visual quality

Mitigation: Construct all roads and railroads to follow the contour of the land as much as practical.

Mitigation: Road lengths and standards will be those necessary for Project activities.

Mitigation: Use natural landform and vegetation to screen roads where applicable.

Mitigation: Design overhead power structures for the ore haulage railroad to be compatible with local landscape.

Impact: Power lines change visual quality

Mitigation: Screen powerline tower sites from view if possible. Locate powerlines behind ridges and out of view of travel routes, towns, residences, and recreational centers. Where this cannot be done, keep towers and conductors beneath the skyline and against a backdrop of hills or ridges. Avoid sidehills, narrow ridges, and small hilltops for tower sites. Use nonspecular materials. Design major road and highway crossings for minimum visual impact by crossing between high points, at dips, or on curves to avoid long views of the line. Utilize long spans at crossings. Use natural screening and land features for maximum concealment. Cross major roads at right angles.

WILDLAND FIRE MITIGATION MEASURES

Impact: Increased numbers of fires

Mitigation: Initiate aggressive public information programs on man-caused fires.

Mitigation: All trucks and tractors or other internal combustion engines used in connection with project activities must have approved mufflers and spark arrestors.

Mitigation: In cooperation with the Forest Service, prepare a fire plan which will set forth in detail the Plan for prevention, control, and extinguishing of fires on the project and associated areas and within areas of responsibility. Such plans shall be jointly reviewed and revised at intervals of not more than three years.

TRANSPORTATION MITIGATION MEASURES

Impact: Increased heavy truck traffic will accelerate road surface deterioration

Mitigation: Initiate a Road Use Permit (SF 7700-41) with the Forest Service to include maintenance, repair or rebuilding as necessary for Project traffic on Forest Service system roads.

GEOLOGICAL HAZARDS MITIGATION

Impact: Increased slope instability and reactivation of landslides

Mitigation: Wherever possible, avoid unstable areas in project design.

Mitigation: Improve drainage in areas of slope instability.

Mitigation: Maintain or decrease ground water levels where applicable.

Mitigation: Install retaining structures.

Mitigation: Remove peat and other compressible organic materials before fill construction.

Impact: Increased rock falls

Mitigation: Route and locate facilities to avoid rockfall areas wherever possible. Use appropriate measures to contain, avoid, or prevent falling rock.

Mitigation: Improve drainage in tailing area with diversion structures.

Impact: Tailing dam stability

Mitigation: Provide for area runoff around tailing pond that will handle the probable maximum flood.

Mitigation: Use earth-fill dam and revegetate.

Mitigation: Revegetate tailing surface after project closure.

Impact: Subsidence (Alternatives 2-5 and 7)

Mitigation: Limit access to the potential area of subsidence during operations and after project closure.

Impact: Disruption of natural topography and contours in areas of surface facilities

Mitigation: Recontour areas of disturbance to blend with surrounding area.

SOILS MITIGATION MEASURES

Impact: Soil disruption during stripping, stockpiling, and redressing

Mitigation: Minimize disturbance time and size of disturbed areas.

Mitigation: Schedule disturbance to coincide with periods when soils are dry, especially in clayey soils.

Mitigation: Minimize traffic and exposure of subsoil materials during construction.

Mitigation: Restrict off-road traffic.

Mitigation: Use low ground-pressure equipment for reclamation.

Impact: Increased soil instability including soil creep and slumping

Mitigation: Stabilize unstable slopes as soon as possible.

Mitigation: Restrict traffic on steep slopes.

Mitigation: Implement erosion and runoff control measures.

Mitigation: Wherever possible, avoid cuts through talus slopes.

Impact: Soil erosion and sedimentation

Mitigation: Control slope length with contouring, ditches, or terraces.

Mitigation: Wherever possible, avoid disturbance of steep slopes.

Mitigation: Revegetate as soon as seasonally possible.

Mitigation: Control erosion with mulch, rip rap, etc.

Mitigation: Use appropriate measures for stream bank stabilization.

Mitigation: Salvage soils of disturbed areas for redressing.

Impact: Decreased soil productivity

Mitigation: Minimize handling during stripping and stock-piling.

Mitigation: Utilize N-fixing legumes and soil inoculation where needed.

Mitigation: Revegetate as soon as seasonally possible.

Mitigation: Carry out reclamation plan.

Impact: Poor revegetation potential of tailing area

Mitigation: Use 6 inches of topsoil or other suitable growth media on the tailing surface on NFS lands to improve revegetation potential. Use fertilizer and other soil improvement measures as appropriate on problem areas.

LAND USE MITIGATION MEASURES

Impact: Interference with other permitted uses

Mitigation: If lands are exchanged that are occupied under permits or easements the Forest Service will encourage the non-Federal owner and the permittee to reach agreement on the disposition of the existing use.

Mitigation: The Forest Service will retain public access on the present access road to Elk Basin.

Mitigation: No fences shall be erected or gates locked upon NFS lands, except by written permission of the authorized official.

Impact: Interference with other developments and structures

Mitigation: AMAX and its contractors will not use any existing developed water sources on Federally-owned lands without written permission from the agency with jurisdiction.

Mitigation: Damage to existing range improvements and structures on NFS lands will be immediately repaired or paid for.

Mitigation: If a barrier on NFS lands used for livestock control is broken or destroyed, the gap thus opened will be fenced to control the drift of livestock. These fences will be built to required specifications. Cattle-guards will be installed as required.

Mitigation: Existing National Forest road access will be maintained. It may be rerouted if approved by the Forest Service.

Mitigation: AMAX will pay the United States full value for all damage to land improvements or other property of the United States caused by AMAX or its contractors.

Impact: Unwanted access

Mitigation: Project-related vehicle traffic on NFS lands will be restricted to designated routes.

Mitigation: New public access, as well as improved public access, will not be created on NFS lands unless specifically approved.

Impact: Unwanted roads

Mitigation: Sock lines will not be strung by driving along the transmission line right-of-way.

AVALANCHE HAZARDS MITIGATION MEASURES

Impact: Accidental extension of active avalanche period during mine operation due to blasting and subsidence

Mitigation: Design and conduct avalanche forecasting program.

Impact: Increased exposure of population and employees to avalanches

Mitigation: Locate facilities and roads in low avalanche hazard areas.

Mitigation: Discourage skiing on Mount Emmons after operations begin.

OTHER MITIGATION MEASURES

Impact: Unanticipated disturbances

Mitigation: Do not undertake surface disturbing activities on NFS lands until a construction plan has been approved by the Forest Service. The plan shall include detailed designs of the planned activities, schedules and sequencing, equipment to be used, planned environmental mitigations, and an analysis of the environmental impacts anticipated.

Mitigation: All modifications or additions to the Plan of Operations must be approved by the Forest Service before surface disturbances related to the changes can begin.

Mitigation: Regularly inspect activities to insure compliance with required mitigation measures.

Mitigation: Hold meetings with the federal agency having jurisdiction over an activity prior to the commencement of surface disturbance to insure that the agency's guidelines and requirements are understood by AMAX and its contractors.

Mitigation: AMAX's contractors and employees abide by the "Rules of Conduct" as listed in 36 CFR 261.4 when working on National Forest System lands.

Impact: Lack of public awareness regarding year-by-year project activities

Mitigation: Regularly announce upcoming activities.

Impact: Inductive interference with other communication facilities

Mitigation: Make provision or bear the reasonable cost of making provision for avoiding inductive interference between any project transmission line or other project work constructed, operated, or maintained under special use permit, and any radio installation, telephone line, or other communication facility installed or constructed before construction of such project transmission line or other project work, and owned, operated or used by the Forest Service in administering the National Forest and land under its jurisdiction. The foregoing provisions shall also relate to any radio installation, telephone line, or other communication facility installed or constructed by the United States after construction of such project transmission line or other project work.

Impact: Unwanted electrical charges

Mitigation: All fences, gates, cattleguard, trailers, or other objects or structures that could become inadvertently charged with electricity, shall be grounded.

Impact: Hazards to public health and safety

Mitigation: Carry on all operations in a workmanlike manner having due regard for the safety of employees: safeguard with fences, barriers, fills, covers, or other effective devices, pits, cuts, and other excavations which otherwise would unduly imperil the life, safety, or property of other persons.

Mitigation: Perform work with explosives in such a manner as not to endanger life or property. All storage places for explosives and flammable material shall be marked "DANGEROUS." The method of storing and handling explosives and flammable materials shall conform to recommended procedures contained in the "Blasters Handbook," published by E.I. du Pont de Nemours & CO., and in all Federal, State, and local laws and regulations.

Mitigation: Design and construct transmission lines in accordance with accepted standards and specifications for lines of similar voltage, capacity, and purpose. Place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between the powerline and telegraph, telephone, signal, or other powerlines heretofore constructed. Place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling and obstructing traffic or endangering life on highways or roads.

TABLE B-2: OTHER MITIGATION MEASURES

TABLE B-2: OTHER MITIGATION MEASURES

The following mitigation measures, along with those listed in Table B-1, are for consideration by AMAX and other governmental agencies and jurisdictions. They were developed by the Forest Service through the environmental analysis process, which included input from the public, AMAX, other agencies, and the Joint Review Committee.

VEGETATION MITIGATION MEASURES

Impact: Potential drying of Mt. Emmons Iron Bog

Mitigation: Attempt to create hydrostatic head within faults by pumping water from the old Keystone Mine or the Mount Emmons Mine into the faults which feed springs to maintain present water quantity and quality.

Impact: Loss or disturbance of riparian or wetland vegetation and farmland

Mitigation: Purchase existing wetlands of similar or better quality for management as wetlands by state or federal agencies or such organization as the Nature Conservancy. Land that has been purchased for exchange with the U.S. Forest Service contains at least 331 acres of wetlands.

Mitigation: Where possible, reclaim gravel pits as lakes and wetlands.

Mitigation: Enhance existing wetlands.

Mitigation: Develop new wetlands.

Mitigation: Develop edges of project reservoirs as wetland habitat.

Mitigation: Place powerline structures and adjust spans to avoid impacts on riparian vegetation and farmlands where possible.

Impact: Increased human disturbance and housing development in cottonwood bottom that is used as an eagle roost area

Mitigation: Implement employee awareness programs.

Mitigation: Protect the area from unnecessary, direct project intrusion.

Impact: Impacts related to increased human population, housing-service developments, birdwatchers, photographers may have impact on sage grouse leks. Ohio Creek leks are on private land which could be developed for housing.

Mitigation: Protect lek areas based on CDOW management plans.

Mitigation: Consider lek areas when purchasing lands for trade.

WILDLIFE MITIGATION MEASURES

Impact: Increased housing development and human disturbance in cottonwood bottom and roost areas used by two wintering eagles

Mitigation: Implement employee awareness programs.

Mitigation: Cooperate in protecting the area from unnecessary human intrusion.

Impact: Increased population will place increased pressure on existing habitats in project area and the County to a lesser degree.

Mitigation: Restrict ORV use on other than maintained roads on AMAX properties.

Impact: Impacts on big game habitat, populations, and life cycles from construction, operation, and increased direct and indirect human activity

Mitigation: (Most mitigation is similar to preceding wildlife mitigations.)

Purchase of winter range areas on private lands for trade to agencies, or the Nature Conservancy, or for management as winter range.

Mitigation: Post wildlife informational warning signs on AMAX property.

Mitigation: Collecting of any wildlife will be prohibited on AMAX property.

Mitigation: Implement and enforce a strict leash law or control ordinance for domestic pets.

Mitigation: Firearms will be prohibited on AMAX property except under special permit.

Mitigation: In cooperation with Forest Service and CDOW, increase productivity of existing winter range areas through fertilization and/or range improvement programs.

Mitigation: AMAX will assist CDOW in emergency winter feeding programs should the need arise.

Mitigation: Employee training programs will include information relative to wildlife laws, regulations, and management programs, location of road kill areas, need for wintering animals to be undisturbed.

Mitigation: Design shift changes away from periods of dawn and dusk when practical.

Mitigation: Support wildlife research programs and projects.

Mitigation: Increase security patrols on AMAX property during movement period and hunting seasons. Restrict or control use of firearms on AMAX property.

Mitigation: Control access onto or through AMAX properties (to public lands) in accordance with safety requirements and recommendations of CDOW and U.S. Forest Service.

Mitigation: With Colorado Highway Department approval, improve and widen Colorado Highway 135 from Almont to Jack's Cabin.

Mitigation: Reduce speed limits along high risk stretches during period when risk is highest (usually during winter in winter range areas). Post high visibility warning near known crossings.

Impact: Noise intrusions during construction of Alkali Basin facilities could cause minor disturbance of eagles roosting along East River.

Mitigation: Minimize blasting during late evening and night when wintering eagles are present.

Impact: Increased presence of humans will increase pressure on huntable species, increase the risk of vehicle-wildlife collisions, increase the chance human-wildlife conflicts, increase the incidence of collecting (reptiles, amphibians, bird nests, etc.) by humans. Increase in domestic pets (cats and dogs) will increase the likelihood of wildlife being killed or harassed.

Mitigation: Increase in enforcement work by CDOW.

Impact: Impacts related to increased human population, housing-service developments, birdwatchers, photographers may have impact on sage grouse leks. Ohio Creek leks are on private land which could be developed for housing.

Mitigation: Consider lek areas when purchasing lands for trade.

Impact: Loss of bird life through collision with power transmission lines and towers in high hazard areas. Note: There are no high hazard areas on the affected NFS lands.

Mitigation: Avoid high hazard areas where possible.

Mitigation: Place lines underground.

Mitigation: Modify tower design.

Mitigation: Change conductor height.

Mitigation: Increase wire visibility.

Mitigation: Cluster lines.

Mitigation: Install shielding structures.

Mitigation: Modify local habitat.

Impact: Increased human populations may increase pressure on remote areas and sensitive areas such as alpine systems, research sites, etc. Activities such as birdwatching and wildlife photography will increase, causing possible alterations in life cycles of such species as cranes, eagles, sage grouse (on the leks), etc.

Mitigation: Assist RMBL in developing and implementing research site protection plans.

Impact: Potential water quality impacts to the Roaring Judy Trout Hatchery (Alternatives 2-4)

Mitigation: Subsurface strata dip to the west away from the hatchery. Ground water will accordingly move westward. Dams will be keyed into bedrock with grout curtains through shallow surficial materials. Natural run-off will be routed around the tailing system. State-of-the-art erosion control, settling basins, and reclamation will be applied to minimize potential for sedimentation.

AQUATIC ECOLOGY MITIGATION MEASURES

Impact: Increased fishing pressure due to population increases

Mitigation: Treatment of Keystone mine water will enhance the opportunity to improve Coal Creek and Slate River water quality.

Mitigation: AMAX will participate with Trout Unlimited in stream improvement projects in the area.

Mitigation: Open AMAX properties to public fishing in coordination with CDOW programs and cooperation with Trout Unlimited.

Impact: Increased nutrient and suspended soils loading to streams as a result of increases in discharge from public domestic waste treatment facilities

Mitigation: Encourage compliance with standards and increased capacity of public waste water treatment facilities.

Mitigation: Encourage regional 201 wastewater study.

Impact: Pollution of receiving streams from accidental spills of oil diesel fuel, or other supplies

Mitigation: Establish emergency contingency program for accidental spills. Include in spill plans arrangements for a warning system to alert sensitive downstream users. Dike all oil, diesel fuel, and similar storage areas.

ENERGY CONSERVATION

Impact: Increases in local energy demand and consumption

Mitigation: Incorporate energy conserving requirements and solar and renewable energy incentives into local building codes, development review, and approval process.

Mitigation: Use carpooling, vanpooling or bussing to encourage energy conservation.

Mitigation: Initiate a community energy management planning process and community awareness program.

Mitigation: Avoid unnecessarily long electrical transmission lines.

Mitigation: Avoid unnecessary hoisting of ore and pumping of water.

Mitigation: Use life cycle costing.

Mitigation: Partially heat the mine using the "Stobie Ice Stope" method which warms air of subfreezing temperature by passing it through a water spray.

WATER MITIGATION MEASURES

Impact: Decreased surface water quality

Mitigation: Operate with no discharge of process water.

Impact: Surface-water flow changes

Mitigation: Obtain mill make-up water from large flow sources during spring runoff periods, if possible. Divert water during other periods when water is physically legally available. Recycle treated waters for reuse.

Impact: Decreased ground water quality

Mitigation: Favor tailing disposal areas with low subsurface permeability and the natural ability to neutralize tailing seepage.

Mitigation: Employ controlled management of ground water, minimizing flow through mobilized zones and the mine-extraction area. Combine favorable aspects of such mitigation techniques as: 1) adit seals with grouting of faults; 2) slurry discharge/inject into the subsidence zone; 3) decant system with drains and new technology.

Impact: Potential disruption of Town of Crested Butte's domestic water supply

Mitigation: In cooperation with the Town of Crested Butte, relocate and improve water supply by moving source to Slate River and constructing well system.

Mitigation: Improve the Town's water treatment system (Alternative 2, 3 and 7)

Mitigation: Move the intake above the fill.

Mitigation: Move the fill below the intake.

Mitigation: Build trestle or bridge. (Alternative 7)

AIR QUALITY MITIGATION MEASURES

Impact: Point source emissions at the mill

Mitigation: Use scrubbers or dust collectors.

Mitigation: Use low sulfur coal.

Mitigation: Use multi-stage feed for incinerator.

Impact: Fugitive dust emissions in the mill-tailing area

Mitigation: Partially enclose or contain emergency coal storage pile. Apply tackifier to surface.

Mitigation: Use water sprays during scraper operations.

Mitigation: Revegetate disturbed areas as soon as practical.

Mitigation: Provide vehicle washes and mud carryout prevention facilities.

Mitigation: Use adhesive binder or wetting procedures on tailing beach area.

Impact: Point source emission within the underground mine

Mitigation: Use catalytic scrubbers on all underground diesel equipment.

Mitigation: Use water sprays at underground draw points.

Mitigation: Use dust collectors at underground loading points.

Mitigation: Use low velocity airflow along with high humidity underground.

Impact: Point source emissions at the mine site

Mitigation: Use high efficiency lime venturi scrubber on boiler.

Mitigation: Use low sulfur coal.

Mitigation: Use scrubbers or equivalent dust collectors.

Mitigation: Use multi-stage feed for incinerator.

Impact: Fugitive dust emissions at the mine site

Mitigation: Partially enclose or contain emergency coal storage pile. Apply tackifier to surface. Use water sprays during scraper operations.

Impact: Increase in vehicle emissions along Project access routes

Mitigation: Investigate use of mass transportation.

Mitigation: Use measures such as car or vanpooling and bussing of employees.

Mitigation: Schedule shift changes to avoid peak traffic periods.

Impact: Increase in secondary emissions

Mitigation: Develop land use planning regulations.

Mitigation: Implement air quality computer programs and possibly emission control regulations.

NOISE MITIGATION MEASURES

Impact: Blasting noise

Mitigation: Perform sonic tests to ensure atmospheric conditions are suitable for surface blasting.

Impact: Operational mine site noise

Mitigation: Onsite vehicle noise - enforce maximum onsite speed limits.

Impact: Operational mill-tailing area noise

Mitigation: Crushing facilities - use noise silencers on building ventilation systems.

Mitigation: Dust collection system - use noise silencers for noise from dust collectors.

Mitigation: Onsite vehicle noise - enforce maximum onsite speed limit.

Impact: Operational ore haulage system noise

Mitigation: Wheel/rail noise - perform regular wheel and rail maintenance to avoid wheel flats.

Impact: Vehicle noise at specific residences

Mitigation: Consider road realignment, use of earth berm barriers and depressed roadways.

Impact: Vehicle noise in the community

Mitigation: Encourage carpooling and restrict truck deliveries to daytime hours, if necessary.

CULTURAL RESOURCE MITIGATION MEASURES

Impact: Indirect heritage resources

Mitigation: Encourage owners to record and protect structures and sites.

Impact: Damage to sites not yet identified

Mitigation: Prior to any ground disturbing activities, perform a cultural resource examination on any unsurveyed lands and develop a mitigation plan in consultation with the State Historic Preservation Officer and the Advisory Council on Historic Preservation.

VISUAL RESOURCE MITIGATION MEASURES

Impact: Roads and ore haulage system change visual quality

Mitigation: Use fill materials (at least the surface of the fill) that are of a color similar to locate materials, as practical.

WILDLAND FIRE MITIGATION MEASURES

Impact: Increased numbers of fires

Mitigation: Initiate more aggressive law enforcement programs.

Mitigation: Provide public services such as chainsaw inspections.

TRANSPORTATION MITIGATION MEASURES

Impact: Increased traffic volumes will reduce the level of service of arterial roads during peak times and increase vehicle accidents.

Mitigation: Initiate carpooling and/or bussing programs.

Mitigation: Establish shift start/end times to avoid other peak hours on arterial access roads.

Mitigation: Reconstruct Highway 135 to provide a uniform service level C and possibly a truck climbing lane. (Alternatives 3 - 6)

Mitigation: Widen the intersection where the mill access road joins the arterial highway to provide acceleration, deceleration, and left turn lanes.

Mitigation: Provide minimal parking at the mine.

Mitigation: Reconstruct the intersection of Colorado 135 and the Ohio Creek Road to permit safer turning.

Mitigation: Route truck traffic to bypass Gunnison's business district.

Impact: Increased accidents caused by conflicts with school bus traffic

Mitigation: Schedule shift changes to avoid the conflicts.

Mitigation: Establish off-highway school bus stops.

Impact: Increased traffic volumes will increase vehicle accidents.

Mitigation: Reduce speed limits.

Mitigation: Increase enforcement.

SOCIOECONOMIC MITIGATION MEASURES

Impact: Residents become alienated and socially isolated due to perceived differences, leading to a number of social problems and breakdown of systems.

Mitigation: Fully support and officially sanction the Human Services Council of the Gunnison Region, Inc.

Mitigation: Provide information to civic groups and other audiences concerning Mt. Emmons and the changes expected to occur.

Mitigation: Establish an impact communications center to provide media and residents with factual information.

Mitigation: Plan and implement a county-wide newcomer integration program.

Mitigation: Initiate creative funding of social services organizations.

Mitigation: Provide for anticipatory staffing and resource levels.

Impact: Increasing demands for general government services

Mitigation: Expand staffs and space, as needed.

Mitigation: Initiate funding and proceed with expansion of library facilities.

Impact: Increasing demands for health services

Mitigation: Carry out the hospital's four-phase expansion plan to coincide with population growth.

Mitigation: Form a hospital district to provide an independent administration and legal vehicle for financing hospital improvements.

Impact: Increased demands for local government funds leading to higher taxes or deteriorating services

Mitigation: Require growth to pay its own way to the maximum degree possible.

Mitigation: Levy a county-wide use tax to tap energy/mineral development for front-end funds.

Mitigation: Raise sales and use taxes before development starts so that growth can help with early financial needs.

Impact: Demands for increased recreational space and diversity causing crowding of existing facilities

Mitigation: Develop a county-wide master plan for parks and recreation.

Mitigation: Form a special metropolitan recreation park district.

Mitigation: Provide a park with active facilities in conjunction with a construction worker camp.

Impact: Increased fire protection needs

Mitigation: Expand fire protection systems as needed.

Mitigation: Consolidate fire districts.

Mitigation: Increase emphasis on planning, code enforcement and inspection during construction.

Mitigation: Ensure that if new building designs or site plans that are approved necessitating a new type of equipment or training, the required items will be available.

Mitigation: Develop a financial plan that will achieve the level of service needed.

Mitigation: Cross train law enforcement officers in basic fire protection.

Impact: Rapid acceleration of crime rates

Mitigation: Increase numbers of trained staff commensurate with needs.

Mitigation: Establish salary levels for law enforcement personnel competitive with industry and metropolitan areas.

Mitigation: Provide attractive fringe benefits for law enforcement employees.

Mitigation: Institute stress reduction programs.

Mitigation: Initiate county-wide law enforcement planning.

Mitigation: Develop a crisis intervention team.

Mitigation: Develop a holding cell for the Crested Butte/Mt. Crested Butte area.

Mitigation: Expand County Jail facilities between 1985-1990.

Mitigation: Schedule work to allow workers to commute to metropolitan areas on weekends.

Impact: Increased capital investment to customer ratios for local utilities, leading to large increases in rates

Mitigation: AMAX pays for project's transmission lines.

Mitigation: Utilities participate in review of major land development proposals to minimize costs of extensions.

Mitigation: Institute a plant investment fee to require new customers to pay for their share of the physical system.

Mitigation: Form an inter-utility coordination committee for planning and coordinating utility service area expansions.

Impact: Shortfalls in wastewater treatment facilities

Mitigation: Complete sub-regional 201 plans.

Mitigation: Develop facility plans as soon as sub-regional plans are completed.

Impact: Shortfalls in Municipal water supplies

Mitigation: Obtain new water rights as new development occurs.

Mitigation: Protect water sources from potential point and non-point pollution.

Mitigation: Structure rates to fully finance water systems.

Impact: Increases in primary and secondary students

Mitigation: Increase the number of students per classroom.

Mitigation: Initiate split sessions.

Mitigation: Provide additional facilities.

Mitigation: Coordinate classroom use with Western State College.

Mitigation: Include school land dedication provisions in land use regulations.

Impact: Housing shortages

Mitigation: Review master plans and include plans to accommodate townhouses, apartments, and mobile homes.

Mitigation: Develop standards to insure quality construction.

Mitigation: Use construction worker housing, when available, for student housing.

Mitigation: Design incentive programs that will generate housing construction.

Mitigation: Maintain advocacy groups for financial assistance programs.

Mitigation: Require low income set-aside units in new developments.

Mitigation: Provide worker housing and recreation facilities for short term workers.

Mitigation: Develop cooperative housing for senior citizens.

Impact: Inadequate solid waste disposal systems

Mitigation: Acquire adequate land for a disposal site to serve entire county's needs through at least the year 2000.

Mitigation: Consider public land sites which require no acquisition costs.

Mitigation: Consider a phased land purchase/lease option over a 20-30 year period.

LAND USE MITIGATION MEASURES

Impact: Increasing demands for additional land to convert to urban uses

Mitigation: Assure that the infrastructure of services is in place, so housing can be constructed to fit within community goals.

Mitigation: Assure that codes, regulations, planning and policies are effective in controlling the spread of new development so that it does not become a threat to agriculture.

APPENDIX C. PROJECT LAYOUT DETAILS

(not included; same as in DEIS)

APPENDIX D. POWER SUPPLY DETAILS

APPENDIX D

Electrical Source

This discussion updates information presented on DEIS p. 345.

After the Mt. Emmons DEIS was sent to the printers, the Colorado Public Utilities Commission (PUC) denied a certificate of convenience to construct the 345 kV transmission line which Colorado Ute had proposed to build through the Paonia area and which the DEIS discussed as the primary source of power for the Mt. Emmons Project.

In correspondence to the Forest Service dated March 11, 1982, Colorado Ute Electric

Association described an alternative plan which they propose will soon be presented to the PUC. This alternative plan would make an equivalent power supply available in the Paonia area and, although different size transformers might be required, would not significantly modify the discussion of impacts in the Mt. Emmons DEIS.

If, at a later date it should be determined that an equivalent power supply could not be provided in the Paonia area and this modifies impacts in the Mt. Emmons FEIS, the responsible official would consider amending the environmental documents.

(DEIS p. 350: add the following information to Table D-3).

230 kV Underground High Pressure Oil Filled*

<u>Materials</u>	<u>Quantities per Circuit Mile</u>
2,000 kcmil copper conductor	98,000 lbs
Insulation (oil-impregnated paper tape)	44,000 lbs
Steel pipe	137,000 lbs
Insulating oil	12,000 gal

*Source EPRI, 1975.

APPENDIX E. LAND CLASSIFICATION DETAILS

APPENDIX E: LAND CLASSIFICATION DETAILS

Because of several changes in organization and wording, this entire section is reproduced here.

INTRODUCTION

The term "classification", as used here, means the act of determining through analysis and documented study the lands which are not suitable for NFS purposes and NFS lands which are most suitable for other ownerships. Classification for landownership purposes and the act of landownership adjustment are closely related, but definitely separate, activities. Classification involves determining the optimum ownership pattern considering the need, suitability, and possible limitations on use. Land ownership adjustments involve the actual process of changing ownership to achieve the ownership pattern approved in land management plans or classification studies. The programs of exchange, transfer, purchase, etc., and the establishment of properties, are functions of landownership adjustment, not of classification.

Classification is a prerequisite to landownership adjustments. Classification planning should reflect the ownership determined to be in the public interest in the long run and should not be limited by current adjustment proposals. Generally, adjustments will be worked out over a period of years on a case-by-case basis in accordance with approved plans.

Parcels of land proposed for inclusion in land adjustment programs must be so classified before such programs can be implemented. If the properties are part of the National Forest System (NFS) and the Forest Service concludes it is in the public interest to dispose of them, they must be classified for disposal before title can be conveyed. Conversely, if properties are under other ownership and the Forest Service concludes it is in the public interest to acquire them, they must be classified for acquisition before title can be acquired. Land classifications are approved by the Regional Forester after receiving Forest Supervisor's recommendations.

Some of the properties offered by AMAX are not currently classified for acquisition by the Forest Service. Additionally, the NFS lands AMAX wishes to obtain are not currently classified for disposal.

This appendix contains only Figure E-7 showing the proposed classifications which are needed to allow land adjustment programs to be processed if they are in the public interest. Figures E-1 through E-6 and E-8 through E-10 remain unchanged from the DEIS.

LAND CLASSIFICATION ALTERNATIVES (Alternatives 2 and 3)

The Forest Supervisors of the National Forests involved

are recommending that the approved classification on their Forests be amended because of changes in land and resource management direction. The alternatives available to the Regional Forester are: (1) approve amendments to the present classifications in accordance with the proposed classifications contained in this appendix; (2) approve amendments to existing classifications as proposed, but with modifications; or (3) not approve these changes.

LAND CLASSIFICATION PROCEDURES

The fundamental objectives of the land classification process are: (1) to identify non-federal lands that are suitable for National Forest purposes and which would find their best use if developed as part of the NFS, and (2) to determine those lands that should be deleted from the NFS with the intent of seeking the optimum landownership pattern. To arrive at this pattern, consideration is given to the following:

(1) Protection and improvement of the environment including soil, water, air, vegetation, fish, wildlife, and natural beauty;

(2) Achievement of a balance of resource uses from both public and private lands that will best meet present and future national, regional, and local needs;

(3) Encouragement of local development, including growth of forest, recreation, range, and mining-based enterprises;

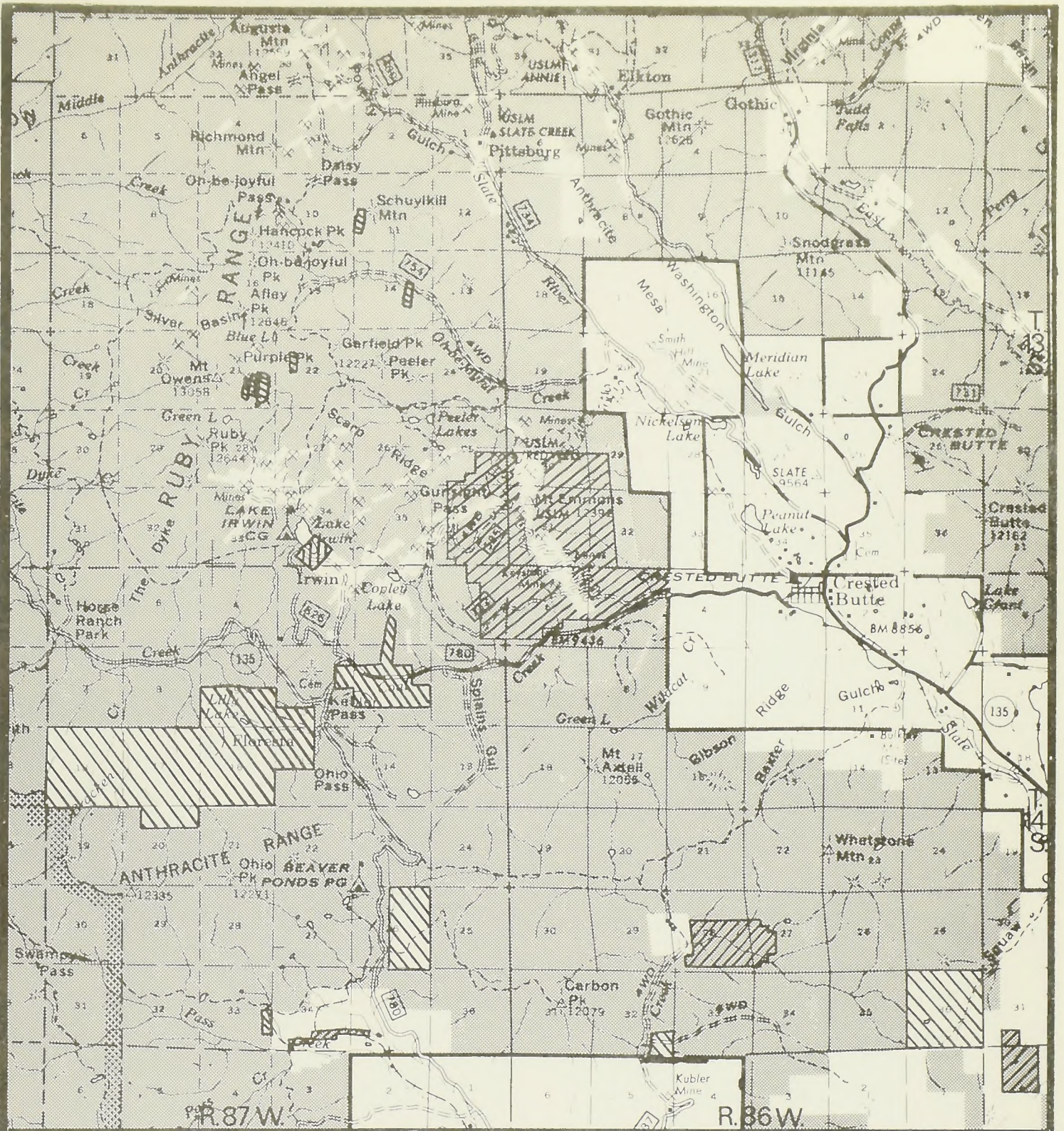
(4) Public wants and needs determined through public involvement by seeking public advice at the national, state, and local levels;

(5) Needs of other federal agencies and state and local governments; and

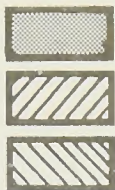
(6) State and county responsibilities for land use planning and zoning.

RECLASSIFICATION JUSTIFICATION

Long range land classification for landownership adjustment needs was not adequately reflected or studied in several Forests original classification plans, nor was it updated in the East River Unit Management Plan on the Gunnison National Forest to facilitate changes in resource management direction. Thus amendments are required and necessary. The primary document used to indicate a need for amending the land classification to facilitate changes in resource management direction is AMAX's Plan of Operations (AMAX 1979a, 1080a, and 1981a).



LEGEND



NFS LAND

DISPOSAL AREAS

ACQUISITION AREAS

0 1 2 3 4 miles



Mt. Emmons Mining Project

GUNNISON NATIONAL FOREST
PROPOSED CLASSIFICATION

July 1981

FIG. E-7 Revised

APPENDIX F. LAND EXCHANGE DETAILS

(not included; same as in DEIS)

APPENDIX G. PROJECT SCHEDULE

(not included; same as in DEIS)

APPENDIX H. REFERENCE GUIDE FOR ISSUE ANALYSIS

(not included; same as in DEIS)

APPENDIX I. METHODOLOGY

APPENDIX I: METHODOLOGY

ENERGY

The following discussion is added to that in the DEIS.

The energy consumption data presented in the DEIS do not include all energy requirements. Although searches were made, no data base could be located which would permit reasonable estimates of the energy requirements to construct the major project facilities (mine pad, mill pad, related facilities, tailing dams and water dams). This is noted on DEIS p. 106. However, it is possible to make a reasonable comparison between alternatives for the following reasons:

1. The assumption noted on DEIS p. 107, that there will be no major differences in the construction energy requirements between the various geographic locations, places all production alternatives (2-7) on a similar scale.

2. Construction energy requirements were estimated for project components that would obviously vary by geographic location (access roads, railroad, tunnel boring).

3. All construction energy estimates were divided by the project life of 30 years to permit the comparison of alternatives on a common base.

This calculation would make the unestimated construction energy component of the production Alternatives (2-7) relatively small when compared to the annual energy requirements of production.

Regardless of the above points, it should be noted that the energy requirements presented in DEIS Chapter 2 would be slightly higher for Alternatives 2-7 than the graph actually shows.

APPENDIX J. STATEMENT DISTRIBUTION

APPENDIX J: STATEMENT DISTRIBUTION

Federal Organizations

Advisory Council - Historic
Preservation
Golden, CO

Agricultural Stabilization &
Conservation Service
Denver, CO

Arapahoe-Roosevelt National
Forest
Ft. Collins, CO

Army Corps of Engineers
Grand Junction, CO

Army Corps of Engineers
Sacramento, CA

Bighorn National Forest
Sheridan, WY

Black Hills National Forest
Custer, SD

Bureau of Land Management
Denver, CO

Bureau of Land Management
Montrose, CO

Bureau of Mines
Denver, CO

Bureau of Reclamation
Grand Junction, CO

Colorado District U. S.
Geological Survey
Denver, CO

Colorado State Conservation
Service
Denver, CO

Curecanti National Recreation
Area
Gunnison, CO

Custer National Forest
Billings, MT

Department of Commerce
Denver, CO

Department of Energy
Denver, CO

Department of Energy
Lakewood, CO

Department of Health,
Education & Welfare
Denver, CO

Department of Housing & Urban
Development
Denver, CO

Department of The Interior
Lakewood, CO

Department of The Interior
Washington, D.C.

Department of Labor
Denver, CO

Environmental Protection
Agency
Denver, CO

Federal Highway Administration
Denver, CO

Gila National Forest
Silver City, NM

Health and Human Service
Denver, CO

Klamath National Forest
Yreka, CA

Kooteni National Forest
Libby, MT

Medicine Bow National Forest
Laramie, WY

National Park Service
Denver, CO

Nebraska National Forest
Chadron, NE

Office of General Council
Denver, CO

Office of General Council
Washington, D.C.

Pike-San Isabel National
Forests
Pueblo, CO

Rio Grande National Forest
Monte Vista, CO

Routt National Forest
Steamboat Springs, CO

Rural Electrification
Administration
Washington, D.C.

San Juan National Forest
Durango, CO

Shoshone National Forest
Cody, WY

Soil Conservation Service
Alamosa, CO

Soil Conservation Service
Denver, CO

Soil Conservation Service
Gunnison, CO

Tongass National Forest
Ketchikan, AK

U.S. Fish & Wildlife Service
Salt Lake City, UT

U. S. Geological Survey
Denver, CO

Western Area Power
Administration
Golden, CO

White River National Forest
Glenwood Springs, CO

Federal and State Elected
Officials

Honorable William L. Armstrong
Honorable Tilman Bishop
Honorable Hank Brown
Honorable Mike Callihan
Honorable Chester K. Enstrom
Honorable Frank Evans
Honorable Gary Hart
Honorable Martin Hatcher
Honorable Raymond P. Kogovsek
Honorable Ken Kramer
Honorable John Lillpop
Honorable Dan Noble
Honorable Patricia Schroeder
Honorable Walter Wadlow
Honorable Tim Wirth

Colorado State Agencies

Air Pollution Control Division

Assistant to the Governor for
Natural Resources

Colorado Geological Survey

Colorado Land Use Commission

Colorado State Clearing House

Colorado State Conservation
Board

Colorado State Forest Service

Colorado State Highway
Department

Department of Natural
Resources

Division of Commerce &
Development

Division of Employment and
Training

Division of Mines

Division of Planning

Division Transportation
Planning

Division of Water Resources

Division of Wildlife

Environmental Affairs

Governor of Colorado

Job Service of Colorado

Mined Land Reclamation Board

Office of Energy Conservation

Office of Environmental
Programs

Office of Medical Care Service

Radiation/Hazardous Waste
Cont. Div.

State Board of Land Commission

State Compensation Insurance
Fund

Water and Power Resource
Service

Water Quality Control Division

Other State Agencies

Alabama Forestry Commission
Montgomery, AL

Montana Department of State
Lands Helena, MT

Wyoming State Forestry
Division
Cheyenne, WY

Local Governments

Chaffee County Board of
Commissioners

Crested Butte City Manager

Crested Butte City Planner

Crested Butte Mayor

Delta County Board of
Commissioners

Delta County Courthouse

Delta County Planning
Commission

Gunnison City Manager

Gunnison City Planner

Gunnison County Board of
Commissioners

Gunnison County Courthouse
CJRP Coord., Dorothy Johnson

Gunnison County Planner

Gunnison County Planning
Commission

Gunnison County Sheriff's
Department

Gunnison Mayor

Hinsdale County Board of
Commissioners

Hotchkiss Mayor

Lake City Mayor

Mesa County Board of
Commissioners

Montrose City Manager

Montrose City Manager

Montrose City Mayor

Montrose City Planner

Montrose County Board of
Commissioners

Mt. Crested Butte City Manager

Mt. Crested Butte Mayor

Olathe County Commissioner

Paonia City Manager

Paonia City Planner

Paonia Mayor

Saguache Mayor

Salida Mayor

Salida City Manager

Salida City Planner

Saguache County Board of
Commissioners

Saguache Mayor

Organizations

American Motorcycle
Association
Westerville, OH

American Wilderness Alliance
Denver, CO

Aspen Center For Environmental
Studies
Aspen, CO

Aspen Wilderness Workshop
Aspen, CO

Challenge - Discovery
(Wilderness Center)
Crested Butte, CO

Club 20
Grand Junction, CO

Colorado Counties, Inc.

Colorado Heritage Center
Denver, CO

Colorado Mountain Club
Boulder, CO

Colorado Mountain Club
Denver, CO

Colorado Mountain Club
Grand Junction, CO

Colorado Mountain Club
Grand Junction, CO

Colorado Open Space Council
Denver, CO

Colorado-Ute Electric
Association

Colorado Wildlife Federation
Ft. Collins, CO

Continental Divide Trail
Society
Washington, D.C.

Crockett Wilderness Program
Crockett, TX

Environmental Center (CU)
Boulder, CO

Environmental Coordinator
Aspen, CO

Environmental Defense Fund
Denver, CO

Federal Timber Purchasers
Association
Denver, CO

High Country Citizens'
Alliance
Crested Butte, CO

League of Women Voters

National Audubon Society
Boulder, CO

National Wildlife Federation
Boulder, CO

Sierra Club
Denver, CO

Sierra Club
Gunnison, CO

Sierra Club
Grand Junction, CO

Sierra Club
San Francisco, CA

Sierra Club
Sante Fe, NM

The Nature Conservancy
Denver, CO

The Wilderness Institute
Denver, CO

Upper Gunnison River Water
District
Gunnison, CO

Izaak Walton League of America
Aurora, CO

Western Colorado Audubon
Society
Grand Junction, CO

Wilderness Society
Washington, D.C.

Wilderness Society
Denver, CO

Wilderness Study Group (CU)
Boulder, CO

Wildlife Management Institute
Portland OR

Wyoming Outdoor Council

News Media

Chaffee County Times Buena
Vista, CO

Colorado Magazine
Denver, CO

Crested Butte Chronicle
Crested Butte, CO

Crested Butte Pilot
Crested Butte, CO

Daily Sentinel
Grand Junction, CO

Delta County Independent
Delta, CO

Denver Post
Denver, CO

Forum Newspaper
Nucla, CO

Fruita Times
Fruita, CO

Gunnison Country Times
Gunnison, CO

KDTA-AM Radio
Delta, CO

KGUC - AM
Gunnison, CO

KOTO - FM
Telluride, CO

KREX - Radio and TV
Grand Junction, CO

KREY - TV
Montrose, CO

KUBC AM-FM Radio
Montrose, CO

KVLE - FM
Gunnison, CO

KWDE - FM
Montrose, CO

Montrose Daily Press
Montrose, CO

North Fork Herald Chronicle
Hotchkiss, CO

North Fork Times
Paonia, CO

Ouray County Plaindealer
Ouray, CO

Palisade Tribune
Palisade, CO

Paonian
Paonia, CO

Rocky Mountain News
Denver, CO

Saguache Crescent
Saguache, CO

Salida Mountain Mail
Salida, CO

Silverton Standard
Silverton, CO

Silver World
Lake City, CO

Telluride Times
Telluride, CO

XYZ Television, Inc.
Grand Junction, CO

Individuals

Lawrence R. Abbott
Glen W. Adams
Seth Adams
Larry Albert
Logan Allen
Paul R. Allen
Ralph R. Allen
Jim Anderson
Noel Andress
Jan Andrews

Mark Anndt
Keith A. Argow
Bob Arkin
Jack Armstrong
Michael Arts
Wayne Aspinall
Shipley Associates
Harvey Atchison
Jim Austin
Al Ayers

H.A. Bachman
Tim Bacon
Susie Bailey
John C. Balla
Fred Barnabei
Betsy Barnett
Ralph M. Barnett
Billy Barr
Hamlet Barry III
Bruce Bartelli

Neal Bastable
James D. Batchelor
Bear Creek Mining Company
Mary Beesinger
Margaret Berard
John S. Berge
Christina Best
Joseph Binder
Rob Bishop
Charles Bishopp

Henri Bisson
John R. Bizer
Kevin Black
Dee Blacklock
Norman R. Blake
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Tom Boggess

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William A. Carlson

Neil F. Casson
CES
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Narcissa Channell
Irvin Chapman
George Chapman
James G. Cheney
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Nan Chobot

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Leslee L. Conner

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Kirk Cunningham

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Jean Curry
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Bud Curtis
William S. Curtis
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Mark Daily
Robert Dalbac
Bill Daniels

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David Delcour esq.
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Kai Der

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Jack A. Durham

Steve J. Durham
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Debra East
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Neil Edstrom
Dave Edy
Dave Efken
Anne H. Ehrlich
Paul R. Ehrlich

Robert B. Ellingsen
Art Ellis
Scott Ellis
Connie Elze
R.K. Enders
Dale Enquist
Chris Ensenberger
C. K. Enstrom
M. A. Esmoil
R. Evan

Chris Evan
Jim Evans
Max T. Evans
Robert Evans
T. J. Fahey
Hugo Ferchau
Robert L. Ferguson
Fred Field
Kerry Fischer
Marguerita Flanagan

Elizabeth Flanagan
Robert A. Flinn
Will Folger
Keith C. Foster
Wallace D. Foster
George C. Francis
Russel Freeman
Jane Fresenborg
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F. T. Graybeal
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Jack Grieb
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R. D. Haack
Peter J. Hagen
Cindy Hahn
John H. Hahn

Raymond A Haik
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Denis B. Hall
Robert G. Halstead
Horace B. Ham
David J. Ham
Terry Hamlin
John Hammer
Chris Hansen
Deann Hanson

Jerold T. Hanson
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James H. Hartman
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Maxine Hatcher
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B. Heidman
Bernard Heinrich
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Dale Howard
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Taidan Hsui
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Jay M. Hughes
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George B. Hutchinson
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Herb Jacobson
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Helen Jarvis
Karen E. Jetley
Dan Jobin
Dennis Johns
Carol Johnson

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E. R. Johnson
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Luanne L. Johnson
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Timothy Jones

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Cindy Kaplan
Paul Kaplan
Paul F. Kavanaugh
Desmond P. Kearns
Larry Keenan
Tom M. Keith

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John F. Kelly
R. E. Kendall
C. Kennedy
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Kellie Kirkham
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Richard D. Lamm
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David Leinsdorf
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David Levinson
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Patricia E. Lewis
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Ronald Lickman
Wes Light
James Lillipop

Linda Lindsey
Greg Lockett
Steve Longshore
Dennis Lothrop
George Love
Judy Lowe
Paul Lowdenslager
W. J. Lucas
Carla I. Ludwig
Sam Lumb

Dennis Lynch
Nick Lypps
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J. Maccubbin
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Chuck Malick
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Alan P. Maloney
Dick Mangan

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Catherine McCuthen

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Clifton Merritt
Laura Mettauer

Charles Metzger
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Henderson Mine
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Lorraine Mintzmyer
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Guy Mock
Ray Moke

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Cocha Moore
John C. Moore
Larry Morrill
Phillip Morrissey
Dick Moss
Kay Moss
Norm Mullen
Emmett J. Murphy

Ceil Murray
Jim Murray
Clark Musgrove
Sue Navy
Alan Neifeld
Donald M. Nelson
Sara Neustadt
Ed Newell
Mary Ann Nichols
Lance Nimmo

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Dave Nordwall	Diane Rhodes	Buie Seawell
Art Norris	Richard Richards	Ross V. Seeton
Arthur J. Norris	J. F. Rinckel	Becky Selle
Beatrice Norris	Michiel D. Riversong	Mary Sewell
Melinda Norris	Roath & Brega	Timothy Shaffer
John Nunnery	Ed Robbins	Kathy Shaw
Jack O'Brien	Judy Robbins	David C. Shelton
Margaret T. O'Brien	D. B. Roberts	Rex Sheppard
Richard O'Brien	Linda M. Roberts	Scott D. Sherwood
Sister O'Malia	Lloyd Roberts	Robert Shields
Alan O'Neill	Tom G. Roberts	Ann B. Shrake
George T. Omalley	Ronald Robinson	J. T. Shrigley
Carol L. Oyster	Ruth Rodriguez	W. Michael Shuster
James W. Packard	Donald Roe	A. J. Siccardi
Mark Paich	Rowena Rogers	Bob Silbernagel
Roy Parker	John Rold	Hal Simpson
Steve Parks	Ted S. Romanik	John Sisk
Monte C. Pascoe	ROMCOE	Gerald D. Sjaastad
Robert J. Patterson	Robert L. Roper	Mary Sjoberg
Jack Patton	Gary L. Rosentrater	Shelby Sjoberg
Kristin Paulson	Ted Rouillard	Tim Slusher
Carol Pearson	Zelda J. Rouillard	Audrey Smith
Jeffrey L. Pecka	Robert J. Rozman	Brenda Smith
Barbara L. Peckarsky	Jane Rubin	Carleton K. Smith
James H. Perdue	H. E. Rudi	Doug Smith
Rick Peterson	Ray Ruehle	Floyd Smith
Paula C. Phillips	Nancy Ruehle	Joseph B. Smith
Fredrick F. Pierce	Harrison F. Russell	Morgan Smith
Amos A. Plante	James H. Ryan	Paula Smith
Adam Poe	Anthony Sabatini	Roy Smith
Claude E. Porterfield	Trio Sales, Inc.	Gary Snell
Stephen Posten	Al Sample	Gary Snider
Ruth Ann Powell	Irvin C. Sanders	Jim Somrak
Jim Powers	James W. Sanderson	Jim Soule
A. B. Pratt	Garbis Sariyan	Lee Spann
Everlyn M. Premo	George H. Saum	B. Spehar
Leonard E. Price	Andell Sawdo	Ben Sprouse
Gary Prin	James Sawyer	Gary Sprung
R. A. Prosence	Sally Sawyer	H. F. Stalf
Cal Queal	Don Scar	Mike Stanwood
Bill Quinn	K. Schipper	Karl Starch
Kim Ragotzkie	Connie E. Schlepp	Cindy Stark
Bob Ramharter	Liv Schmale	Jim Starr
John Raybourn	Steve Schmitz	John Starrs
Missy Reda	Michael Schneider	Eric Steacy
Charlotte Redden	Kimberly Schoppert	W. Keith Stegall II
Terry Reed	Patricia Schroeder	Anne Steinbeck
Robert Regan	John I. Schumacker	Alan M. Stewart
Martin A. Rehm	Hal Scott	Doug Stewart

Jan Stewart
J. B. Stone
Nancy Strong
Lewis Stum
David Sumner
SUNEDCO
Mike Svilar
Mitchell Swain
Sally Swain
Susan Tarlton

John Tarr
Derrell P. Thompson
Pat Tienney
Geoff Tischben
TMT Corporation
J. W. Todd
William Tomlinson
Kathy A. Tonnessen
Ann Tracey
Frank Traylor

Henry Treube
Robert Trout
Noreen Turner
Bob Tweedell
Two Shell Plaza
Grant Tyson
Dallace Unger
Raymond P. Van Tuyl
John Vanderhoff
Carla Vanderzander

Barry Vaughan
Pat Venturo
Ann Vickery
James Violet
Joyce Violet
Walter J. Wadlow
Kenneth Waesche
Louis S. Wall
Arden Wallum
David Walsh

Rocky Warren
Daniel Watt
Kenneth L. Watters
Robert Weaver
Erick W. Weidmann
Sheila B. Weissberg
Ruth Welch
Noel Wellborn
Lynn Wetherell
Al Whitaker

Dave White
Willis H. White
Scottii Willey
C. Ray Wilson
Janet Wilson
Dick Wingerson
Pat Winn
A. Walter Wise
Donald R. Witlow
Craig Witten

Steve Wolcott
Diane Wolfe
Rodney L. Woods
Wooward Clyde Consultants
Betty Worey
Robert E. Wright, Jr.
William Wrobul
Donna Wyatt
Dyan Zaklowsky
Marlene Zanetell
Karen Zolinski

APPENDIX K. FISH AND WILDLIFE SERVICE REPORTS

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Fish and Wildlife Coordination Report . . .	200



United States Department of the Interior

FISH AND WILDLIFE SERVICE
AREA OFFICE COLORADO-UTAH
1311 FEDERAL BUILDING
125 SOUTH STATE STREET
SALT LAKE CITY, UTAH 84138

IN REPLY REFER TO: (ES)

March 23, 1982

S.H. Hanks, Deputy Regional Forester
U.S. Forest Service
Rocky Mountain Region
11177 West 8th Avenue
P.O. Box 25127
Lakewood, Colorado 80225

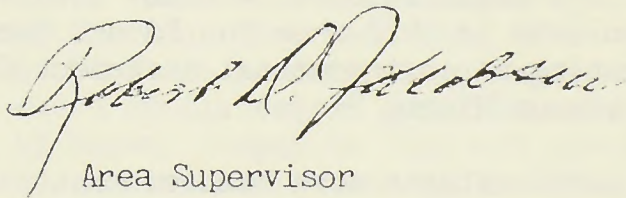
Dear Mr. Hanks:

This letter is a response to the Mount Emmons biological assessment received in our office on February 18, 1982.

We have reviewed the biological assessment and the draft environmental impact statement and concur with your determination that no listed species will be impacted by the project. Since we agree with your determination regarding no impacts to listed species, Formal section 7 consultation is not necessary. If the proposed project plans change appreciably or if new information indicates an impact to listed species, section 7 consultation must be reinitiated.

Please contact Fred Bolwahn if you have additional questions. We appreciate your interest in conserving listed species.

Sincerely yours,


Area Supervisor



United States Department of the Interior

FISH AND WILDLIFE SERVICE

AREA OFFICE COLORADO-UTAH

1311 FEDERAL BUILDING

125 SOUTH STATE STREET

SALT LAKE CITY, UTAH 84138

IN REPLY REFER TO: (ES)

February 4, 1982

Mr. Jimmy R. Wilkins, Forest Supervisor
Grand Mesa-Uncompahgre-Gunnison National Forests
P.O. Box 138
Delta, Colorado 81416

RE: Fish and Wildlife Coordination Report on the Proposed Mount Emmons
Project Proposal and Its Alternatives

Dear Mr. Wilkins:

This report has been prepared under the authority of, and in accordance with the provisions of the Fish and Wildlife Coordination Act (48 Stat. 401, as amended; 16 U.S.C. 661 et. seq.) in our role as a cooperating agency as described in the Statement of Responsibilities for the Amax - Mount Emmons Project. This report describes the fish and wildlife impacts that would result if the project is completed following the proposed configuration, or either alternative under study. It also proposes means and measures to mitigate fish and wildlife impacts caused by project completion.

We wish to thank the many employees of the Colorado Division of Wildlife (CDOW), U.S. Forest Service (FS), AMAX, Corps of Engineers (CE), and other Federal and state agencies for their contribution of time and information to make this report possible.

INTRODUCTION

Fish and Wildlife Service (FWS) involvement in the Mount Emmons Project began late in 1978 when the Forest Service announced that they would be preparing an environmental statement for the proposed Mount Emmons Molybdenum Mining Project.

Early FWS efforts were handled mostly through our Denver Regional Office. As the project progressed, the coordination functions were handled by our Colorado-Utah Area Office in Salt Lake City, Utah.

Our involvement in Federal projects or private developments requiring Federal permits comes from provisions of the Fish and Wildlife Coordination, Endangered Species, Migratory Bird Treaty, Bald Eagle Protection, National Environmental Protection and Clean Water Acts. We evaluate project proposals sent to us for potentially major consequences to fish and wildlife resources, or their habitats, and the appropriateness of our actions under one or more of these Acts. Whenever a project is determined to meet these criteria we investigate its impact potentials to determine our level of involvement. Our involvement in the Mount Emmons Project was determined to include the Fish and Wildlife Coordination Act, National Environmental Protection Act, Clean Waters Act and Bald Eagle Protection Act.

PROJECT PROPOSAL

The proposed Mount Emmons project includes an underground mine on Mount Emmons where molybdenum ore would be mined and loaded onto an electric train for a 14-mile haul to a processing mill in upper Alkali Creek Basin. The rail right-of-way would cross Coal Creek valley then goes through a 4-mile tunnel in Mount Axtell, continuing south along the east sides of Carbon Creek and Ohio Creek Valleys entering a shorter tunnel under Red Mountain and finally to its terminus at the Alkali Creek mill. A 1,040 acre tailings disposal reservoir would be constructed below the mill in upper Alkali Creek Basin, with a second makeup water reservoir built on Alkali Creek downstream from the tailing pond dam and reservoir. A mine access road would be built from Crested Butte to the Mount Emmons mine, and a mill access road would be constructed connecting the Alkali Creek mill with Colorado Highway 135 about 5 miles north of Almont. Raw water reservoirs would be built on Carbon Creek in the Ohio Creek drainage and Elk Creek in the Coal Creek drainage.

A mine area of roughly 3,000 acres would be located about 3 miles west of Crested Butte and would include a 917 acre subsidence area, 127 acre mine portal site and other structural features. Land for the raw water reservoirs on Carbon and Elk Creeks would approximate 290 and 100 acres respectively. The 80 acre mill site, 1,040 acre tailings disposal area, 64 acre make-up water reservoir and other habitat disturbances would occupy more than a 5,000 acre land block in upper Alkali Creek basin between Red and Flat Top mountains, with a 220 acre access road up Alkali Creek from Colorado Highway 135 to the mill site. An electric railway would connect the mine site on Mount Emmons with the Molybdenum processing plant in Alkali Basin.

EXISTING ENVIRONMENT

The elevation of the project area ranges from about 8,000 feet above sea level to the 12,392 foot peak of Mount Emmons. The lower elevations are found along Ohio Creek and East River valleys, and the higher points are the various mountain peaks between the East River and Ohio Creek valleys. Vegetative cover at the lower elevations is predominately sagebrush shrubland with some hay meadows where irrigation is possible. As elevation increases sagebrush is replaced by aspen, lodgepole pine and spruce-fir forests. At the highest elevations are subalpine and alpine meadows, subalpine willows, rock/talus slopes and alpine fellfield habitats. Riparian and wetland habitat types, which have a disproportionately high value for wildlife than the amount present would indicate, also occurs in the project area. These latter habitat types will be discussed separately because of their importance and sensitivity.

There are about 170 species of terrestrial animals in the project area, which includes about 50 mammals, 115 birds, 5 reptiles and amphibians. Some of these species are dependent on a single habitat type for all or part of each year, such as picas to rock slides or sage grouses' total dependence on the single plant species bigleaf sagebrush (Artemisia tridentata) for its food for over 9 months of the year. Others, such as

mule deer and elk, are more ubiquitous and use nearly all habitat types during some part of the year; however, winter forces them to migrate to restricted winter ranges. Big game populations in the project area are limited by the amount of winter ranges.

Our wildlife description of the existing environment will focus on a limited number of wildlife species where data is available on populations and habits, and where mitigation potential exists to offset project caused losses. Limiting the discussion to these few species does not imply that those not discussed are unimportant, but only that adequate information is not available to predict the degree of project caused impacts, or that means and measures to mitigate those impacts are unavailable or impracticable.

Elk

The Mount Emmons cooperative big game study findings made by the Colorado Cooperative Wildlife Research Unit conform with the information collected by the CDOW. The wintering elk herds in the following areas are discussed here: (1) Development Area, between Colorado Highway 135 on the east side, Allen's Lane along the south, Ohio Creek along the west side and Mount Emmons vicinity to the north; (2) East Area, which lies north of U.S. Highway 50 and north east of Colorado Highway 135, and; (3) West Area, which lies north of U.S. Highway 50 and west of Ohio Creek, including the West Elk Wilderness. Winter herd populations are used in the discussion because of the limiting nature of winter range on populations.

Development Area

There is an elk herd of about 200 head in the Development Area according to Division of Wildlife census reports (Colorado Division of Wildlife, 1981). These animals generally winter in or near the southern end of the development area along the lower south and southwest slopes of Flat Top and Red Mountains and in and near the private lands along Ohio Creek. Winter range is in short supply and resulting damage to private hay stacks limits the herd size.

As spring arrives, elk leave the winter range for higher elevations, gradually moving northward to the calving grounds on the west slope of Red Mountain. Calving occurs in late May and early June. Following calving the Development Areas' elk herd spreads throughout higher elevations on Red Mountain, Upper Carbon Creek, Gibson Ridge, Carbon Peak, Alkali Basin, Splains Gulch and the north slope of the Antracite Range. They remain in these dispersed areas through the hunting season and until winter conditions cause them to move back to the winter range. Their return route follows the higher elevations southward to Red Mountain and the north rim of Alkali Basin, from where they cross to Flat Top Mountain following the fingerlike aspen patches extending towards Alkali Creek from both mountains. As winter deepens the elk move to the lower slopes of Flat Top and Red Mountains and the bottomlands near Allens Lane and Ohio Creek.

East Area

Wintering elk numbers approximate 850 head in that part of the East Area likely to be impacted by the Mount Emmons Project according to census counts made by the CDOW in 1974, 1975, 1978 and 1979, when counting conditions were good. These elk normally winter in the Almont Triangle, and the drainages of Leaps Gulch, Lost Canyon, Sheep Gulch, Roaring Judy Creek, Cabin Creek, Sewell Gulch, Beaver Creek, Fisher Creek and Copper Creek. Winter range is in short supply and limits the Division of Wildlife's potential to increase the herd.

When the East area elk herd leave the winter range with the onset of spring they move to the higher elevations and their calving grounds. Major elk calving concentrations include the headwaters of Alder Creek; Beaver Creek-E. Beaver Creek - Three Mile Creek area; Lottis Creek; Spring Creek and west side of Cement Creek south of Double Top Mountain. Following calving these elk spread out throughout the higher elevations west of the Taylor River and east of the East River drainages and to the Taylor River - Gunnison River - Tomichi Creek divide area where they remain through the fall season. As winter sets in, the elk move back towards the winter range.

West Area

There is a wintering herd of about 455 elk in the West Area, based on counts made by the CDOW in 1975, 1978 and 1979 when counting conditions were good, which could be impacted by the Mount Emmons Project. This winter range is in the Antelope Creek, Steers Gulch and the Ohio Creek drainage west of that stream. In the severest winters elk move down near Blue Mesa Reservoir. Winter range is probably at or near capacity and limits the possibility of increasing the herd under present land use practices.

As spring arrives the elk move towards their calving areas at higher elevations on the headwaters of Soap Creek; West Antelope-Mill Creek; and Pass Creek-Little Pass Creek-Castle Creek areas. Following calving the elk spread out throughout the higher elevations in and around the West Elk Wilderness where they remain until winter conditions cause them to move back to the winter ranges.

Deer

Deer populations are less well known than elk. Winter range is the most crucial factor in deer's annual life cycle in Gunnison County. This is true because deer are less able to cope with the usual persistent deep snow and the competition from elk for food which forces them to the lowest elevations-including haylands and more urban environments. Urban risks of harassment, dogs and vehicle strikes increase, as well as death from food compaction commonly associated with drastic changes in diet during severe winters when deer change from accustomed diets of range forage to unaccustomed grass hay.

Deer in the development area winter at the lower elevations along Ohio Creek, East River and on the ranch lands along Allens lane, however there are no winter census count records. During other times of the year these deer disperse throughout the higher elevations in the development area.

In the East area deer winter at the lowest elevations in the Almont Triangle, Leaps Gulch, along the Gunnison River and Cabin Creek near U.S. Highway 50 east of Gunnison. Again there are no census count records. During other times of the year these deer disperse throughout the higher elevations in the Taylor River - Spring Creek - Brush Creek - Cement Creek drainages.

The West area deer winter range is found in the Ohio Creek, Antelope Creek, Steers Gulch and Beaver Creek drainages and generally north of U.S. 50. Based on counts made in these areas during 1975, 1978 and 1979, when counting conditions were good, the winter population may approximate 200 head. During other times of the year, these deer disperse throughout the higher elevations to the north, including the West Elk Wilderness.

Sage Grouse

Sage grouse are a very unique bird species because of their requirement for the single plant bigleaf sagebrush (Artemisia tridentata) for their livelihood. The evergreen sagebrush leaves furnish their total food needs for nine or more months of the year. Extensive sagebrush stands provide their winter habitat, while breeding leks or strutting grounds are openings in the sagebrush. Over 90 percent of all sage grouse nests are located under or between sagebrush plants according to Patterson, (1952), Gill, (1965); Keller et. al, (1941), Gray (1967), Wallestad and Pyrah (1974) and others. In the summer, midday loafing areas are established in sagebrush cover near riparian, seep or hayfield feeding areas, while year-around escape cover is always a sagebrush stand within a relatively short flight distance.

Sage grouse populate much of the sagebrush habitat in the Mount Emmons study area. Annual strutting ground trend counts are made in the Ohio and Antelope Creek localities; however, no strutting ground trend counts are made on known strutting grounds on Red and Flat Top Mountains because of their inaccessibility during the census period. Overall there is too little information available to make population estimates of sage grouse.

Gunnison county makes up part of Colorado's Small Game Management Unit 66. Sage grouse hunting evaluations in the unit are made annually using hunting questionnaires, aerial flights and wing collections. Through the evaluations for the 1978 through 1980 seasons hunter harvest averaged 1,227 birds per season in small game unit 66 (Olterman, 1981).

Blue Grouse

Blue grouse are native forest grouse found throughout the montane forests in the project area. They are classed as a game bird by the State of Colorado and are hunted annually by sportsmen. Harvest in Gunnison County may amount to over 1,000 birds per year.

Blue grouse exhibit what is sometimes called a "reverse migration" pattern, that is, migrate up to higher elevations to winter and down to lower elevations during the summer to breed and raise broods. The downslope migration occurs in May near the onset of the breeding season. Solitary males establish territories where the courting ritual and breeding takes place. Females usually nest in open forest environments near grassy openings where the newly hatched chicks will have ample insects and succulent vegetation to eat. In the late summer the broods break up and the grouse begin their upslope migration to the wintering areas in the high conifer forests. During the winter the grouse feed on the buds and needles of fir and spruce trees.

Riparian Habitat

Riparian habitat is the transition zone between aquatic and upland habitat types. It is a specialized form of wetland restricted to areas bordering upon perennial, intermittent or ephemeral streams; lakes with stable water levels; and fluctuating reservoir or lake shore areas. Soils of riparian habitat may not exhibit typical wet soil characteristics of wetlands, but if not wet soil characteristics will exist close enough to the surface for water to be used directly by the vegetation. Vegetation may vary from hydrophytes to terrestrial willows and cottonwoods. Riparian habitat is limited and its destruction or degradation is irretrievable.

Riparian habitat is the most productive wildlife habitat there is in the west, and it is equally important to the productivity of aquatic habitats and fishes. Riparian zones protect and prevent physical and chemical deterioration of aquatic systems by shading, filtering, and in general buffer hazardous aquatic impacts originating on the uplands. Recent research results have demonstrated that riparian habitats receive more use per unit area by wildlife than any other type.

In the Mount Emmons Project area nearly all the wildlife species depend on riparian habitat for all or part of their needs. A few of the important wildlife uses of riparian habitat includes: summer feeding areas for sage grouse broods, most habitat needs for beaver, mink, muskrats and raccoons, blue grouse brood feeding areas, all or part of the habitat needs for migratory and resident birds, and winter shelter for elk and deer. These are only a few of the values of riparian habitats to fish and wildlife.

Wetlands

Wetlands are areas that are covered with surface water or saturated by surface or ground water sufficient to support hydrophytic plants. Examples of some of these hydrophytic plants are sedges (Carex sp.), rushes (Juncus sp.), cattails (Typha sp.) or bulrushes (Scirpus sp.). All wetlands are not alike, therefore various local names may be used to describe lands which are in fact wetlands. Some of these terms may include wet meadows, stream bottomlands, sloughs, seeps and marshes.

The amount of wetlands nationwide is limited and declining at a rapid rate due to drainage for agricultural, industrial and residential development. This accelerating loss of wetlands has been recognized by the legislative and executive branches of several levels of government which have enacted numerous laws, orders and regulations, beginning with the Migratory Bird Treaty Act (Duck Stamp Act) in 1934, to protect this declining habitat resource.

Wetlands are a special habitat type that have high fish and wildlife values. Some values are quite apparent where mallard broods are seen feeding in a beaver pond; however, lesser known are their importance in maintaining ground water supplies and their water purification role. Wetlands are essential habitat for beaver, muskrats, waterfowl, shorebirds, frogs, toads and salamanders. Under the Cowardin wetland classification system, wetlands in the project area would fit one of the following classifications shown in Table 1.

As a consequence of the extreme importance of wetland and riparian habitats to fish and wildlife and other resources, many laws, executive orders and agency regulations have been issued to assure riparian and wetland habitat protection.

Table 1. Wetland Types in the Project Area

System	Class	Subclass	Water Regime	Water Quality	Special Modifier
Palustrine	Unconsolidated bottom	mud	permanently flooded	fresh	impounded (beaver pond)
Palustrine	Emergent wetland	persistent	seasonally flooded	fresh	
Palustrine	Emergent wetland	persistent	saturated	fresh	
Palustrine	scrub-shrub	broadleaf deciduous	seasonally flooded	fresh	
Palustrine	scrub-shrub	broadleaf deciduous	saturated	fresh	
Riverine upper perennial	Unconsolidated bottom	cobble gravel	permanently flooded	fresh	
Riverine intermittent	Unconsolidated bottom	cobble gravel	intermittently flooded	fresh	

Fisheries

There are exceptionally fine trout waters in Gunnison County, some of which are in the project area. Brown, rainbow, cutthroat and brook trout are all available and are heavily fished for by local and visiting fisherman, making Gunnison County the second most popular county in the state for total fishing pressure according to Division of Wildlife records (CDOW, 1976). The Gunnison and East Rivers also attract heavy fall fishing pressure when kokanee (Oncorhynchus nerka), a land locked fresh water salmon, make their annual spawning run up these streams from Blue Mesa Reservoir.

The Gunnison River is the main stream draining the entire project area. It begins at the confluence of the East and Taylor Rivers at Almont and flows south and west to eventually join the Colorado River. Principal game fishes in the Gunnison River are brown and rainbow trout and kokanee salmon.

East River, with its Slate River, Brush Creek and Cement Creek tributaries, are important stream fisheries. Slate River receives waters from Coal Creek at Crested Butte which drains the south slopes of Mount Emmons. Coal Creek was heavily polluted by drainage from the old Keystone Mine which is now part of AMAX's Mount Emmons mine. AMAX has since constructed a treatment facility which detoxifies the mine drainage before it is discharged into Coal Creek. The town of Crested Butte also takes its water supply from Coal Creek, immediately above the old Keystone Mine drain. The Gunnison-East-Slate Rivers system separates the Development and East areas previously discussed. Predominate game fish in the project's portion of the East River are brown and rainbow trout and kokanee salmon, while in Slate River, Brush Creek and Cement Creek rainbow and brook trout predominate.

Ohio Creek, another tributary to the Gunnison River, separates the Development Area from the West Area. It flows southeasterly from Ohio Pass to its confluence with the Gunnison River approximately a mile north of Gunnison. Castle and Mill Creeks are larger sport fish tributaries draining lands west of Ohio Creek, while Carbon Creek is a sport fish tributary that heads in the Development Area. The predominate game fish in Ohio, Carbon, Castle and Mill Creeks is brook trout.

Tomichi Creek originates along the Continental Divide east of Gunnison and empties into the Gunnison River near the south edge of Gunnison City. The predominate game fish in lower Tomichi Creek is brown trout.

Gunnison, East, Slate and Taylor Rivers and Tomichi Creek are ranked as Highest-Valued Fishery Resource (Value Class I) according to the 1979 Stream and Lake Evaluation Map for the State of Colorado (USFWS, 1979). This value ranking was based on the criteria that the habitat; (1) maintains outstanding populations of species of high interest as defined by the State; (2) these streams have self sustaining "wild" populations that maintain a high yield or value; and (3) this habitat has very low or essentially no potential for restoration or reclamation

of the habitat to its present species composition and population levels, no alternate resource could be introduced that would be as highly valued; no acceptable options are available to compensate for the loss of this habitat, at the present time.

Cement and Castle Creeks are ranked as High-Priority Fishery Resource (Value Class II). This value class was based on the criteria that; (1) habitat that is intensively used in terms of the several requirements of a highly-valued population or required habitat for less highly-valued populations of a species of high interest; and (2) low potential for restoration to present species composition and population levels; however, partial compensation options can be defined.

Ohio, Mill and Carbon Creeks are ranked as Moderate Fishery Resource (Value Class III). This value class is based on the criteria that it is: (1) habitat that is occasionally used by a highly-valued population of a species of high interest or an essential habitat for maintaining a relatively low-valued population of a species of high-interest (occasionally-used habitat implies that reduction of that habitat would not seriously impair the continued existence of the population); and, (2) moderate potential exists for either restoration of the habitat or reclamation to an equal or higher-valued fishery, or total compensation options can be defined.

The State of Colorado's Roaring Judy Fish Hatchery is located along the East River on the edge of the Development Area approximately one-half mile below the confluence of Alkali Creek, an intermittent stream flowing out of the Development Area. Roaring Judy is Colorado's second largest salmonoid production unit. The hatchery has a maximum flow capacity of 28 cfs and averages 18-20 cfs. The water supply is taken directly from East River immediately downstream from Alkali Creek's mouth. Occasional supplemental water is pumped from any or all of four wells near the hatchery's East River diversion and some may be taken from the Alkali Creek ditch. Roaring Judy Fish Hatchery is a vital part of western Colorado fish management program, with an ultimate annual production goal of 3 million kokanee eggs and 1.5 million Snake River cutthroat eggs; 650,000 catchable rainbow; 2 million cutthroat, brook and rainbow fingerlings.

IMPACT ASSESSMENT OF THE PROPOSED ACTION AND ALTERNATIVES

Impacts to the fish and wildlife resources that would be caused by completion of AMAX's Mount Emmons Project can be divided into primary and secondary impacts. Primary impacts are those that would be caused by the construction and subsequent operation of the mine and mill in each alignment under consideration. Primary impacts for each alternative would be site (alternative) specific. Secondary impacts however are essentially people impacts which would remain constant for all alternatives. Primary impacts are discussed for each alternative with the secondary impacts described separately.

Mount Emmons Mine

The Mount Emmons mine development and its operation would have the same impacts to the fish and wildlife resources and their habitats, regardless of the millsite alternative selected; therefore, it too will only be described once.

Development of the mine on Mount Emmons would have short and long term adverse impacts on elk, deer and blue grouse but would not cause a decrease in elk or deer numbers in Gunnison County. The mine location is in elk and deer summer range and its development would negatively impact summering animals and may alter their movement around Mount Emmons. Summer range is not considered limiting for either species and this impact would not reduce their numbers in the project area.

Fish Habitat

The potential for contamination of fish habitat exists around the mine portal area. Accidental spills are the most likely stream pollution cause originating at the mine portal area. Spills would adversely affect Coal Creek, Slate, East and the Gunnison Rivers. Spills would likely be short term events and dispersed through dilution as the contaminants move down drainage.

Alkali Creek Alternative

The Alkali Basin alternative is the preferred choice of AMAX and the least preferred alignment of the fish and wildlife interests for the Mount Emmons Project. Under this alternative the greatest negative impacts would be caused to elk and wetland-riparian habitat out of the three alternatives considered. Potentially high negative impacts could also damage downstream fish resources and their habitat, including the Roaring Judy fish hatchery. Substantial losses of sage and blue grouse habitat would affect their populations, although the losses cannot be quantified. No estimates were made on what Alkali Basin impacts would do to the deer resources.

Elk

The Alkali Basin mill and tailings alternative would cause a loss of 160 elk to the development area herd. This loss would be attributed to: (1) destroying 1,623 acres of indispensable winter range; (2) loss of elk use values on over 7,000 acres of winter range that includes a buffer area of up to a mile beyond the periphery of the mill and tailings area caused by disturbing activities of construction, operation and maintenance of the facilities; (3) and by destroying migration travel lane value between normal winter range and their critical winter range on the south and southwest slopes of Flat Top and Red Mountains.

Alkali Basin is important elk winter range during mild winters and excellent transition winter range in more severe winters. It provides a mix of plant communities well suited for winter food and shelter and is isolated from human disturbance during the elks' stay. Deep snow and

poor access make human encroachment difficult and enforces isolation from disturbance. Construction would destroy 1,430 acres of big sagebrush, 99 acres of irrigated pasture, 48 acres of grassland, 31 acres riparian willows and 16 acres of aspen woodlands all which are heavily used by elk.

Elk are known for avoiding the close proximity of human disturbances. Ward (1973) found elk preferred to be at least 1/2 mile away from relatively light out-of-the-vehicle activities such as fishing, picnicking, camping and cutting timber. Hockley (1981) reports elk do not come within one mile of U.S. Steel's South Pass (Wyoming) taconite mill and mine. This mine and mill was constructed in historic elk winter range. The distance elk keep between any disturbance may vary somewhat depending upon vegetation or topography shielding them from view. Hiding cover is required if full use of an area is to occur. Black, et. al. (1975) reports elk hiding cover should be between 4 and 8 sight distances (600-1200 feet). The openness of the feeding areas in Alkali Basin would not provide the necessary shielding for feeding elk, or provide shielded travel lanes between their feeding habitat and thermal and/or hiding cover. Thermal cover associated with winter ranges must be considered carefully. Winter range, because of its scarcity and intensity of use in the Project area, is more sensitive to land management decisions. The Alkali Basin mill/tailings site would reduce the established elk hiding and thermal habitat values, by its location, to near zero. Elk values would be lost over a large part of this winter area beyond the periphery of the mill and tailings area.

Elk cross though Alkali Basin in established travel lanes between Red and Flat Top Mountain following the aspen woodland fingers extending down from the mountains towards Alkali Creek. Travel lanes conceal elk moving across areas that lack cover. Black et. al. (1975) described the size, shape and distribution of elk travel lanes as continuous cover with an optimum width of 450-600 feet, or non-continuous patches of cover separated by 300 feet or less, as travel lanes. These woodland fingers are classic examples of travel lanes used by elk. When the elk follow the woodland fingers their exposure distance is considerably reduced. The nearness of mill, tailings pond dam and make up water reservoir would destroy these travel lane values during and following construction. These effects would terminate elk migration between the higher winter range and the critical winter range on the lower south and southwest slopes of Flat Top, that is essential when deep snows force them out of the higher winter range.

With these expected impacts in the development area the displaced animals would be expected to cross over into the adjacent east and west areas. Both of these areas are at the maximum capacity and the additional elk could not be accommodated. State management would require increasing hunter kill, or let them suffer heavy winter losses rather than pay large damage claims to area ranchers.

Deer

Impacts to deer in the Development Area from the Alkali Basin Mill-tailings area development alternative could not be determined with the data we have. It is possible to speculate however that a positive impact on deer from the Alkali Basin Mill-tailings development may occur from the reduced elk competition for winter forage and because deer have a lesser avoidance reaction to disturbance. The Mount Emmons mine, raw water reservoirs and rail corridor may alter summer distribution but not affect deer population numbers because they will occur in summer range which is not believed to be limiting.

Sage Grouse

A decrease in sage grouse numbers would occur in the Development Area with construction of the Mount Emmons Project with the Alkali Creek alternative; however, the magnitude cannot be determined. Large scale removal of sagebrush would reduce available winter and nesting habitat. The destruction of meadow-wet meadow wetland habitat types in Alkali Basin for the tailings disposal area would adversely impact sage grouse brood rearing habitat. There is a growing awareness of the importance of mountain meadows to sage grouse and Savage (1969) and Oakleaf (1971) noted heavy use of meadows in July and August in Nevada.

Blue Grouse

It is expected there would be a slight negative impact to blue grouse because of developing the Alkali Creek alternative of the Mount Emmons Project. This effect would result from destruction of nesting and early brood habitat around seeps and damp areas at the interface of wooded and open areas. This habitat type would be destroyed by construction of the railroad rights-of-way, raw water reservoirs and mill.

Wetland-Riparian Habitat

There would be 111 acres of wetland-riparian habitat destroyed by the Alkali Creek alternative. The loss would include 8 acres of natural moist/sedge meadow type, 40 acres subalpine willow, 59 acres of riparian willows and 4 acres of cottonwood woodlands. These losses would adversely impact waterfowl, beaver, mink, deer, elk, white-crowned sparrows and other wildlife species dependent on wetland-riparian habitats. Most important would be its accumulative effect of the continuing nationwide reduction of the finite wetland-riparian base.

Fish Habitat

The potential for contamination of fish habitat exists downdrainage from the confluence of Alkali Creek with the East River.

A serious potential for stream pollution exists below the Alkali Basin Mill and tailings area. Contamination from this area could have either short or long term impacts on fish habitat. Accidental spills along the Alkali Creek access road getting into the aquatic system would cause short term impacts down drainage. Contamination from the Alkali Basin tailings - plant areas entering the aquatic system from massive spills, percolation, infiltration or leaching of toxic materials would have long term adverse effects in East and Gunnison Rivers and Blue Mesa Reservoir. The effects on aquatic organisms could range from sub acute to acute toxicity depending upon the pollutant and concentration levels.

Roaring Judy Fish Hatchery

The possibility of water pollution downstream from Alkali Creek poses a serious threat to Colorado's Roaring Judy Fish Hatchery. Water quality requirements for a fish hatchery is exacting and essentially inflexible. Since the hatchery operates on water taken directly from the East River, any catastrophic water pollution event originating in the Alkali Creek drainage could kill all the fish in the hatchery facility within minutes, and reduce its functional value for about two years. Replacement costs of a total fish kill from a short term event at Roaring Judy would approximate \$500,000, based on 1981 values. A long term event would cause the immediate loss of fish in Roaring Judy Hatchery and depreciate its future value as a fish rearing facility to zero.

Chance Gulch Alternative

The Chance Gulch Alternative is the preferred alternative of Colorado Division of Wildlife and the Fish and Wildlife Service. It was developed by us and presented to AMAX and the Forest Service for their consideration in 1979, following our analysis of the Alkali Basin alternative. Our analysis of the Alkali Basin alternative and proposing the Chance Gulch alternative to AMAX and Forest Service is part of our role as a cooperating agency in accordance with the Fish and Wildlife Coordination and National Environmental Protection Acts.

Elk, Deer, Blue Grouse, Fisheries, and Roaring Judy Fish Hatchery

The impacts that the Alkali Basin alternative would cause to elk, deer, blue grouse, fisheries and the Roaring Judy fish hatchery, could be avoided by selecting the Chance Gulch alternative.

Fish Habitat

The potential for adverse impacts to fish habitat would be significantly reduced if the Mount Emmons project would be built following the Chance Gulch alternative.

Possible short term and long term pollution impacts from spills, percolation, infiltration or leaching of toxic materials could occur in Tomichi Creek below the confluence of Chance Gulch, and in the Gunnison River below Tomichi Creek.

Sage Grouse

Sage grouse would be the most seriously impacted wildlife species we evaluated with the Chance Gulch alternative. The entire 2,194 acres of sagebrush vegetation that would be destroyed is sage grouse winter range. The reduction in sage grouse numbers in Chance Gulch because of habitat destruction cannot be determined with the base population data available for that vicinity.

Riparian - Wetland Habitat

The Chance Gulch alternative would destroy 82 acres of wetland - riparian habitat; however, none is within the Chance Gulch area.

Upper Carbon/Ohio Creek Alternative

Mount Emmon's Upper Carbon/Ohio Creek Alternative would have considerably less impact on fish and wildlife resources and their habitat, than Alkali Creek alternative, but more than the Chance Gulch alternative. No adverse impacts would be caused to sage grouse, nor would there be a potential threat to the fisheries in the East and Gunnison Rivers between the confluences of Alkali and Ohio Creeks, or to the continued value of the Roaring Judy Fish Hatchery.

Elk

The Upper Carbon/Ohio Creek alternative would encroach upon 1,869 acres of elk summer range, migration routes, and a small amount of early winter habitat. This encroachment would be expected to reduce the elk population in the development area by about 20%, or 40 head. There does not appear to be a shortage of elk summer range in Gunnison County at the present time; therefore, a loss of summer range at the alternate Upper Carbon/Ohio mill and tailings site would have little effect on Gunnison County's elk population.

Elk are known to avoid disturbances and maintain considerable distance between themselves and a disturbance. Ward (1973) found elk preferred to be at least one-half mile from people engaged in out-of-vehicle activity such as camping, picnicking, fishing or harvesting timber. Hockley (1981) reports elk to maintain a one-mile buffer zone between them and U.S. Steel's South Pass taconite mine and mill near Lander, Wyoming. Presence or absence of hiding cover or travel lanes that shield elk from view were also found to influence how much distance elk maintain between their activities, and disturbances were found to be important by Black, et. al. (1975).

Extensive contiguous cover types surrounding the possible 1,869 acre Upper Carbon/Ohio Creek mill and tailings area is similar to that on site, where 76% is represented by aspen woodlands (650 ac.) spruce-fir forests (577 ac.) and lodgepole pine (194 ac.). All of these cover types would provide hiding cover (travel lanes) for migrating elk; however, due to the overall size of the project, plus the buffer zone elk maintain, the disturbance would cause some elk intending to migrate to winter range near Flat Top and Red Mountains in the Development Area to be redirected to an already fully occupied winter range in either the East and West areas.

Mule Deer

The Upper Carbon/Ohio Creek alternative mill and tailings area would be in deer summer range and there does not appear to be a shortage of mule deer summer range in Gunnison County. No estimates were made on the probable impacts of developing this mill and tailings site for deer.

Blue Grouse

The number of blue grouse that would be lost with development of the Upper Carbon/Ohio creek mill and tailings alternative has not been determined because the base data is lacking to make these determinations. Losses of blue grouse per unit area would be high, however, because this location represents as good of blue grouse habitat for all seasons, as there is in Colorado.

Wetland - Riparin Habitat

There would be approximately 107 acres of wetland-riparian destroyed by the Upper Carbon/Ohio Creek alternative. At this site there is a high population of beaver. When development would begin, the resident beaver would be forced to emigrate to other areas, thus creating management problems. Beaver habitat on these public lands is at or near saturation now and displaced beaver would be forced to move on to private lands where they are not wanted because of their nuisance behavior in irrigation systems. Other wetland - riparian wildlife values adversely impacted would be mink, snowshoe hares and white crowned sparrows.

Fish Habitat

Short and long term pollution impacts could impact Carbon, and Ohio Creeks below the mill and tailings reservoirs and the Gunnison River below its confluence with Ohio Creek. If toxic materials would enter the aquatic system below the mill and tailings area from the Upper Carbon/Ohio Creek site, it could be greatly lessened down drainage during the irrigation season when contaminated water would be withdrawn from Ohio and Carbon Creeks for irrigation. This would prevent its release in the Gunnison River.

SECONDARY IMPACTS

Secondary impacts are offsite impacts that would occur regardless of which alternative is selected. They are the "people" impacts, or more simply, offsite impacts caused by meeting the needs and the actions of the new residents settling in Gunnison County because of the Mount Emmons project. Secondary impacts caused by development of Mount Emmons would include: (1) loss of wildlife habitat because of secondary development; (2) increased big game damage complaints; (3) increased wildlife losses by road kills; (4) increased poaching losses; (5) increased wildlife harassment; (6) increased hunting and fishing pressure; (7) reduced public access for hunting and fishing; (8) increased use of streamflows for domestic and industrial use; (9) increases range management problems. These impacts may act individually or synergistically with other impacts, and thus increase the adverse impacts by more than the sum of single impacts when acting individually.

Loss of Wildlife Habitat Caused by Secondary Development

Nearly doubling Gunnison County's population would require extensive new construction of housing, stores, supply centers, community service facilities, and roads/streets to meet the needs of the expanded community. It could include new communities and subdivisions in now rural areas. These developments are expected to occur at lower elevations on private lands now being ranched. New developments would reduce the limited amount of big game winter range.

Increase Big Game Damage

The reduced big game winter range would cause additional complaints of game damage to private property. As ranch lands are converted to residential and commercial development, the remaining cropland would experience more concentrated big game use, especially in severe winters.

Increased Wildlife losses Because of Increased Roadkills

Increased traffic through wildlife habitats has been correlated with increased roadkilled wildlife. Traffic volume would increase in the project area and most main roads are already through critical big game winter range. These animals would be highly concentrated making them more vulnerable to vehicle strikes. Big game - vehicle strikes are highest when the animals first arrive in the concentration areas and immediately preceding spring departure.

Poaching Losses

Poaching losses have been found to significantly increase in "boom town" situations throughout the Rocky Mountain region. Increased poaching would be expected to follow "boom town" patterns established in other Rocky Mountain areas.

Increased Wildlife Harassment

Population increases would increase recreationists use of the outdoors. Snowmobiling and cross-country skiing in big game winter range would increase harassment of winter stressed animals. Increased population in "boom town" areas brings an increase in free roaming dogs. Free roaming dogs are known to harass and even kill big game animals, especially in severe winters.

Increased Hunting and Fishing Pressure

Local fish and wildlife populations would receive heavier hunting and fishing pressure as the population rises and the demand for these resources increases. As a result game populations would be reduced, limits would be lowered, success would go down and fish populations would have to be more heavily supported with expensive hatchery fish.

Reduced Public Access for Fishing and Hunting

Increasing populations would speed up urban spread, more mountain cabin development and increase demands for hunting and fishing access exceeding the tolerances of landowners. Considerable private lands are adjacent to streams in the Gunnison area where urbanization and mountain cabin development is expected to occur. As these developments expand, access would come to an end. Ranchers would become more reluctant to allow more access to hunt or fish to protect their properties from damage, litter and harassment of livestock. Traditionally as populations increase, public access for hunting and fishing declines.

Increased Use of Streamflows for Municipal and Industrial Purposes

More water would be withdrawn from local streams for domestic and industrial uses as development progresses. Reduced streamflows would adversely affect fisheries.

Increase Range Management Problems

Additional competing demands for the range resources would increase range management problems.

MITIGATION RECOMMENDATIONS

Our initial analysis of the proposed Mount Emmons Project determined what potential impacts its development would have on fish and wildlife resources and their habitats. After that assessment was made, we considered whether the project could be realigned to: (1) avoid the adverse impacts that would happen to fish and wildlife resources; (2) minimize adverse impacts to fish and wildlife resources that could not be avoided; (3) rectify impacts by restoring the affected environment; (4) reduce or eliminate the impacts over time during the life of the project; and (5) compensate for impacts by replacing or providing substitute resources or habitats.

Our analysis, based on these criteria, led us to propose the Chance Gulch alternative to AMAX and the Forest Service on October 18, 1979. Chance Gulch is the preferred alternative of the Fish and Wildlife Service and the Colorado Division of Wildlife and we continue to recommend its selection; however, mitigation recommendations for each alternative under consideration are as follow:

Alkali Basin Mitigation Recommendations

We recommend mitigating the loss of 160 elk out of the development area herd by procuring 421 AUM's of replacement elk winter forage in any location in the West Area bounded by Steuben Creek (east) and Willow Creek (west) and between U.S. Highway 50 (south) and the Gunnison National Forest (north). These elk grazing rights should be guaranteed by either purchasing private land, permanent easements on private lands or permanently reallocating 421 AUMs of livestock forage to elk on public lands administered by the BLM or Forest Service. The Colorado Division of Wildlife should be consulted during all negotiations for their concurrence.

This recommendation would recoup elk losses in the near vicinity to where they occurred. The requested elk winter forage is in the proximity of the Sapinero big game winter range where the Colorado Division of Wildlife has successfully mitigated previous elk winter range losses caused by the Bureau of Reclamation's Curecanti Project. Additional elk winter range would blend in with the management of the Sapinero unit. We believe this recommendation allows maximum flexibility for reasonable negotiations necessary to acquire the elk winter forage.

Wetland - Riparian Habitat

We recommend 111 acres of non wetland habitat capable of developing into wetlands, and the water necessary to artificially create and maintain wetland habitat, be purchased and converted to wetlands to replace the wetland-riparian habitat destroyed by the Alkali Basin alternative. We recommend these replacement wetlands should be located in the Tomichi Creek valley between Sargents and the Gunnison River, with highest priority given to the vicinity immediately south - southeast of Gunnison. Land control should be invested with a public agency and managed to benefit wetland dependent wildlife, including waterfowl.

We make this recommendation refuting suggestions that: (1) Exchange lands would include enough wetlands to mitigate destroyed wetlands (5.3.6 Land Exchange Impacts, AMAX, 1981); and (2) wetlands that would be disturbed have low wetland values, therefore their loss does not matter (5,4,2,4,10, Wetlands, AMAX, 1981).

The Fish and Wildlife Service rejected those arguments because: (1) the total wetland base would be reduced by the amount of wetlands destroyed and wetlands destroyed are wetlands lost; (2) low wetland values resulting from incompatible uses are a temporary phenomenon. As long as wetlands exist they have latent potential for improvement, regardless of condition; however, when wetlands are irretrievably lost, their potential for improvement is also lost; (3) these recommendations are in compliance with the intent of Executive Order 11990, Protection of Wetlands.

Fish Habitat - Roaring Judy Fish Hatchery

We believe the greatest potential of the Mount Emmons Project damaging some of the most valuable fish habitat in Colorado exists by selection of the Alkali Basin alternative. It also is the only alternative that presents a threat to the continued productivity of the Roaring Judy Fish Hatchery. For these reasons we recommend the following stipulations be made part of special permits issued for the construction and operation of the Mount Emmons Project: (1) AMAX immediately remedy all damage to fish resources and their habitat caused by the Mount Emmons Project by restoring them to a condition equal to, or better than it was when damaged; (2) AMAX should guarantee the replacement "in kind" of the Roaring Judy fish hatchery should its productivity be impaired by the Mount Emmons Project. Noncompliance with these stipulations should be reason for revoking special permits needed for the continued operation of the Mount Emmons Project.

Sage Grouse - Blue Grouse

There are no viable options available to mitigate sage grouse and blue grouse losses caused by the Mount Emmons Project.

Chance Gulch Alternative Mitigation Recommendations

Elk - Deer - Blue Grouse - Fisheries - Roaring Judy Fish Hatchery

The Chance Gulch alternative would avoid adversely impacting elk, deer, and blue grouse as well as removing the potential adverse impacts to the fish resources in the East and Gunnison Rivers below Alkali Creek and the continued use of the Roaring Judy Fish Hatchery.

Sage Grouse

Adverse impacts to sage grouse could not be mitigated because there are no practicable options available for the Gunnison area to offset losses. The benefits to elk, deer, blue grouse, fish resources and Roaring Judy gained by the Chance Gulch alternative would help compensate for losses of sage grouse.

Wetland - Riparian Habitat

We recommend 82 acres of non wetland habitat capable of being developed into wetlands, and the water necessary to artificially create and maintain wetland habitat, be purchased and developed to a wetland type habitat to replace the wetland-riparian habitat destroyed by the Chance Gulch alternative. We recommend these replacement wetlands should be located in the Tomichi Creek valley between Sargents and the Gunnison River, with highest priority given to the vicinity immediately south - southeast of Gunnison. Land control should be invested with a public agency and managed to benefit wetland dependent wildlife, including waterfowl.

Upper Carbon/Ohio Creek Alternative Mitigation Recommendation

Elk

We recommend mitigating the loss of 40 elk this alternative would cause in the Development Area elk herd, by procuring 105 AUMs of replacement elk winter forage in any location in the West Area bounded by Steuben Creek (east) and Willow Creek (west) and between U.S. Highway 50 (south) and the Gunnison National Forest (north). These elk grazing rights should be guaranteed by purchasing private land, permanent easements or permanently reallocating 105 AUMs of livestock forage to elk on public lands administered by BLM or the Forest Service in this area. The Colorado Division of Wildlife should be consulted during all negotiations for their concurrence.

Blue Grouse

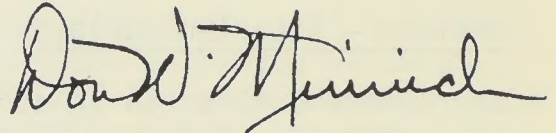
There are no viable options available to mitigate blue grouse losses caused by the Upper Carbon/Ohio Creek alternative.

Wetland - Riparian Habitat

We recommend 107 acres of non wetland habitat capable of being developed into wetlands, and the water necessary to artificially create and maintain wetland habitat, be purchased and developed to a wetland type habitat to replace the wetland - riparian habitat destroyed by the Upper Carbon/Ohio Creek alternative. We recommend these replacement wetlands should be located in the Tomichi Creek valley between Sargents and the Gunnison River, with highest priority given to the vicinity immediately south-southeast of Gunnison. Land control should be invested with a public agency and management to benefit wetland dependent wildlife, including waterfowl.

Secondary Impact Mitigation Recommendations

Most of the mitigation potential to reduce the effects of people impacts rests with local entities of government and public agencies through the zoning and regulatory process. AMAX, however, could assist in providing easements for hunting and fishing to as much of their lands in Gunnison County as possible, to help satisfy the demands for these needs.

A handwritten signature in dark ink, appearing to read "Donald W. Minich". The signature is fluid and cursive, with the first name "Donald" and last name "Minich" being clearly legible.

Regional Director
Fish and Wildlife Service
Region 6

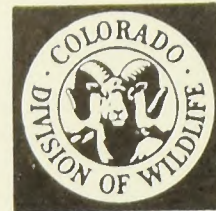
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STATE OF COLORADO
Richard D. Lamm, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
Jack R. Grieb, Director
6060 Broadway
Denver, Colorado 80216 (825-1192)



February 10, 1982

Mr. William White
Acting Area Manager
Federal Building, Room 1311
125 South State Street
Salt Lake City, UT 84138

Dear Mr. White:

We have reviewed and concur with the attached U. S. Fish and Wildlife Service final coordination report for the proposed Mount Emmons mining project.

Sincerely,

A handwritten signature in dark ink, appearing to read "Jack R. Grieb", is written over the typed name and title.

Jack R. Grieb
Director

JRG/CJG/ag

Enc.

APPENDIX L. MICROFICHE REFERENCE SYSTEM

APPENDIX L: MICROFICHE REFERENCE SYSTEM

The following is a complete listing of the contents of the microfiche reference system described on DEIS page 7. The number of each entry is its identification number in the system.

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